

# COAL AGE

McGraw-Hill  
Publishing Company, Inc.  
James H. McGraw, *President*  
Edward J. Mehren, *Vice-President*

*Devoted to the Operating, Technical and  
Business Problems of the  
Coal Mining Industry*

John M. Carmody  
*Editor*

Volume 33

NEW YORK, JULY, 1928

Number 7

## *Common Ground*

OUT in Kansas, where gas and oil continually challenge coal in the common market-place, a retail coal merchant several months ago dreamed of a united industry which would vitalize flagging interest in his commodity by a national coal week. This Topeka retailer, to be sure, was not the first man who has dreamed of a common defense against the encroachment of competitive fuels. Nor was the particular direction of his dream specially appealing to those who had groaned under the advertising impacts of national this-and-that week.

BUT Mr. Turner of Topeka has not been satisfied with dreams alone; he has wanted the action which makes dreams reality and gives life to ideas. As a result of his persistent campaigning a group of operators, wholesalers and retailers met in New York City April 27. Some who attended were frankly doubtful of the value of the conference, but those "who came to scoff remained to pray"—not because of a conviction that a national coal week could contribute to the upbuilding of the industry but because that idea was submerged and practically lost in a better plan.

THAT plan, announced June 11 by the Committee of Fifteen authorized at the April meeting, calls for the organization of a Coal Industry Conference representing anthracite and bituminous operators, wholesalers, retailers, manufacturers of equipment sold to the coal industry, and the railroads.

It would be the primary function of this conference to promote increased consumption of coal by regaining lost markets, checking further competitive losses and finding new uses for coal. As a necessary complement to this purpose would be an educational campaign to create good will for the industry.

SUCH a program is broad enough to offer common ground for every branch of the industry. That each branch has its own peculiar problems which must be solved must, of course, be recognized. But pursuit of the solution of these individual problems is by no means incompatible with co-operative effort in attacking those phases of the situation which affect all. The manufacturer serving the mines with equipment and the railroad hauling the coal have as big a stake in the success of the industry as the individual producer or retail distributor.

MOREOVER, not the least of the by-products of such co-operative effort would be the clearer understanding each branch would gain of the special problems of every other branch. And with clearer understanding the opportunities for sympathetic and intelligent co-ordination would be greatly enlarged. Finally, if the industry is to win public confidence and achieve profitable stabilization, it must have within itself some common understanding and purpose that will justify friendly public consideration. The Conference idea has the germ of greater good than probably even its authors realize.



*Courtesy Kennedy & Co., N. Y.*

**Main Street, Mahanoy City, Pa.**

*From an Etching by  
Joseph Pennell*



# *Are Fundamentals Being Neglected in Machine Loading?*

*By A. F. Brosky*



**N**O loading machine should fail to give satisfactory results, provided conditions under which it works are for the most part suitable. Mechanical loading has now been practiced intensively for about five years, under all kinds of conditions, and from this experience has emerged an understanding of the requisites for successful operation of the machine. If the existing knowledge, now widely scattered, were pooled and analyzed it could be so classified as to be effectual for the solution of almost any loading-machine problem.

Certain fundamentals have been established, and about combinations of these as nuclei can be developed a technique for every set of conditions where mechanical loading is practicable. It is significant that where mechanical loaders yield large tonnages these fundamentals are closely adhered to, and that where the machines make mediocre showings these fundamentals are grossly neglected.

The pioneering days in this field are over. It is no longer necessary for management to feel its way into mechanical loading. Knowing the fundamentals and applying them wisely, any management can make a fairly good go of it right from the start. The elements of procedure once having been established, performance will improve with practice.

It is the intention here to consider some of the fundamentals of good practice and simultaneously to point out the pitfalls which have caused many of the failures. Strictly, the fundamentals fall into two classes: those more particularly associated with management and those more a part of the plans of operation.

To start, what is a mechanical loader? It is exactly what termi-

nology for it implies: a machine for loading coal. The machine is designed for this one purpose only, and any violation of proper use, as attempts to apply it to the digging of coal, puts needless strains on the mechanisms. Improper functional application and loss of time due to breakdowns therefrom remove the machine from service and lessen its productiveness as a loading agent.

This means that cutting, drilling and shooting must be so exactly executed that the freed coal lies in much the same state at the face as when finally disposed in the railroad car. No matter how involved are the measures for accomplishing this end, they must be taken.

**A** MECHANICAL loader is a continuous type of machine and should be operated with few interruptions. It is not to be inferred from this that the machine should load coal practically continuously, for while it is being moved or otherwise made ready for loading it actually is in operation.

Delays due to the shifting of cars to and from the machine represent a considerable part of the time lost. In installations where machines are load-

ing 250 to 300 tons a shift each in room and pillar mining, with track in the last crosscut or a switch added to the room track as an alternative arrangement, these delays total about 15 per cent of the working time. In some instances this item is as high as 40 per cent. The first given percentage of lost time can be reduced appreciably only by the use of double track or by loading onto a conveyor.

The taking of coal directly from a loading machine by mine cars should be considered as a makeshift arrangement. Just as certainly as loading machines have been made to operate successfully conveyors will be applied as take-offs from these machines, and mine layouts planned to permit of their use in this manner. The tremendous advantage in increased output of loading machines operating in conjunction with conveyors is sufficient to justify the additional equipment investment, but not in a room-and-pillar layout. As an experiment, at a certain mine a loading machine was tried at the face of two rooms in which shaking conveyors were installed. The machine cleaned up the two places, loading 16 tons in 10 minutes, including moving and other delays. Avoidance of car-shifting delays is a fundamental which has been mastered by few.

**M**UCH time is wasted waiting for the delivery of empties from the tippie. In going over twenty time studies of loading machines operating under a wide range of conditions the writer found that the average time lost waiting for trips was 11 per cent of the shift, the greatest loss on this account being 30.2 and the least 3.9 per cent. The average loss of time waiting for trips at a certain mine where mechanical loading has been

particularly successful is 6.9 per cent of the shift. These delays largely are inexcusable.

Delays due to inadequate preparation of coal for the loading machine mount up to large totals in many instances. Time studies of a loading machine over a period of 64 shifts at one mine showed that the machine was idle 22 per cent of the average shift because the coal had not been properly prepared. This figure is unusually high, granted, but it is not uncommon to find time losses of 5, 10 and 15 per cent on this account.

Miscellaneous delays—low voltage, poor track, breakdown of the machine due to careless handling and maintenance, etc.—may not detract much, individually, from the productivity of a machine but altogether may considerably lower the efficiency. Where management is alert these delays are largely avoided. Constant attention to upkeep is fundamental.

**N**O FACTOR contributes more to the success or failure of mechanical loading than does the plan of working. So far, nearly all loading machines other than those of the scraper type have been applied to room-and-pillar mining. Nevertheless, despite beliefs to the contrary, the writer hazards the opinion that the most promising possibilities of success in mechanical loading generally lie in longface mining. Simplicity of operation is a fundamental upon which only longface mining is based. The room-and-pillar system is too complicated by reason of the fact that a relatively small tonnage is gotten from each cut, necessitating much moving about. However, where the seam is unusually thick and permits driving fairly wide places this disadvantage is not so pronounced.

The longface system is viewed with much trepidation because it is felt that the roof over the faces is difficult to control. This fear is proof that an important fundamental of mechanized mining is not fully appreciated—namely, that the difficulties of roof control diminish as the speed of recovery is increased. Open-end mining or slabbing of relatively large square-block or rectangular pillars will be common practice not many years hence. This system has been followed for about five years in a loading-machine installation which the writer looks upon as one of the most successful in the country, namely that of the Gay Coal & Coke Co., in Logan County, West Vir-

ginia. Day after day, and year after year, an output of over 200 tons a shift per machine, double-shifted, has been produced at this mine.

To state that working places should be concentrated for mechanical loading may savor of triteness, yet the widespread neglect of this fundamental justifies its consideration here. Working places in which loading machines operate are scattered more often than not. Quite frequently more places are allocated to a machine than it is capable of cleaning up during a shift. The extra places are assigned as reserves to meet the contingency of certain of the total number not being prepared properly or at all. In a nicely balanced system a cut is taken from every working place every day, barring unusual circumstances. A clean-up schedule for working places is as basic in machine as in hand loading.

Mechanical loading calls for a higher degree of science in management. The outcome usually is decided by the attitude of management in the earliest days of the undertak-

ing. Those in charge of the work should spend most of their time on the job, for direct control and responsibility are prime necessities.

**A** WARNING is here sounded against the danger of misapplication of the principle of functional control to mechanical loading. Where schemes of highly ramified functional control have been tried in the early stages of mechanical loading they have proved to be more of a handicap than of an advantage. Functional control means control through *experts*, one for each classified group of details relating to operation. Few, if indeed any, experts in machine loading have yet been developed. Where functional control is attempted it should be confined within the shadow of the plant—that is, the agents should spend most of their time at the working place and there devise methods and develop their duties. Only in this way will they attain expert knowledge, for close contact with an operation is essential to full appreciation of the problems.

---

**WHERE THE HIGHER OFFICIALS** and the general office are remote from the operation, as is frequently the case in coal mining, a high degree of decentralized control is essential. Otherwise red tape crops out to slow down execution, scatter authority and responsibility and bring about chaos. The men in charge of individual plants should be so capable that the management is willing to vest in them the requisite authority for getting things done. Mechanical loading has emphasized the desirability of this arrangement.

---

ing. If management is lax and superficial in its methods mechanical loading must surely fail. Where negligence and carelessness in the carrying out of orders are tolerated the undertaking quickly goes to seed, the good workers become discouraged and management is faced with a situation much more trying than at the start. The best of talents should be set to the task of directing the operation. The employment of any Tom, Dick or Harry to guide the work is common and has resulted in many a failure. Analytical thinking, resourcefulness, aggressiveness and initiative are far more necessary in mechanical than in hand loading.

Orders and plans for the execution of the work must be set up in specific form, and uncalled-for transgression of any of these must not be allowed. They cannot be formulated in detail by men who stick close to the office, for in that case they are likely to be

**A** COMPANY operating a number of mines loses rather than gains by attempting to apply mechanical loading to several plants simultaneously. It is better to concentrate all machines and managerial efforts to one plant until such time as units progressively demonstrate their ability to carry on successfully.

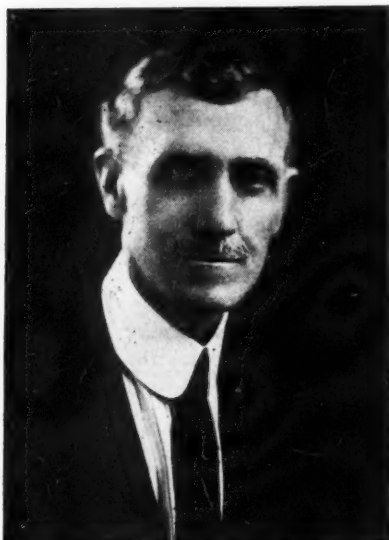
A stumbling block to progress in machine loading is the toleration in management of men in any measure of authority relative to the operation who are not sympathetic. Sometimes when they do not openly voice their opposition their interest is only passive, which is equivalent to condemnation in its effect on the morale of the organization. Though they may not deliberately hinder progress certainly they do not contribute to it. Success requires not only intelligent management of the immediate job but the enthusiastic co-operation of the entire organization.



# What Is the Matter With Illinois?

By Oscar Cartridge

Consulting Engineer,  
Charleston, W. Va.



**A**T LEAST four major changes are necessary if Illinois mines are to compete successfully against Southeastern non-union coal. The first of these is relief from the burden of surface support which would make it possible to recover all the coal in the ground. This must be arranged between the farmer who owns the land and the lessee.

The mines of Illinois recover, except where the coal is thin, not much more on an average than 50 per cent of the coal in the ground. By obtaining nearly 100 per cent, which is possible, the operator will double his coal reserves and the lessor will double his available royalties.

Coal in the central and southern parts of the state has an average thickness of 7 ft.—much of it is 9 to 14 ft. thick—and an acre of 7-ft. coal will contain about 12,000 tons. If 6,000 tons is the present recovery, another 6,000 tons is available and should be saved. Royalty rates are from 3 to 10c. a ton, 5c. being a fair average. This extra 6,000 tons at 5c. equals \$300 an acre to the lessor.

**S**CARCELY a farmer in Illinois but will take a chance on damages to his surface property for \$300 an acre if he can be shown, as is entirely possible, that regular and practically complete extraction of his coal will damage the surface little, if any, for farming purposes. Unless existing leases are revised, the lowest possible mining costs cannot be attained.

The second requirement is the elimination of the existing law which demands that crosscuts between rooms and entries be driven at every 60 ft. of advance. In 1910-11 I assisted in an advisory capacity in the revision of the Illinois mining laws; I well remember how strenuously the miners on the committee objected to increasing that much-debated distance. The

operators finally arranged for its extension where entries had to be driven around the shaft bottom.

Other states, notably Pennsylvania, with more gas, made crosscuts less frequently, but our miners saw the matter not alone as a safety measure. To them it appeared that the shorter the distance the more the yardage for narrow work. In those days we did not have the present improved means for providing ventilation, and perhaps it was as well that the miners took the stand they did.

**B**UT now there is no excuse, for with flexible tubing, places are being driven without crosscuts yet with perfect safety and comfort. We hear much about the danger from electrically driven fans, but permissible motors can now be had that can be used with safety. How unreasonable it is to contend that electric fans and flexible tubing are safe if properly located but that they should not be used because the man in charge might place them so that the air would be recirculated over the motor, and because motors might be protected but starters might not be and so forth!

Fans and motors can be properly

located and protected, and the man who will not do so will fail also to keep line brattice or other ventilators up to the face and in safe condition. Such men should not and will not last long when operators and miners both get completely in earnest about safety.

The present Illinois laws, I believe, give the Director of Mines a certain latitude as to the distance between crosscuts, up to 250 ft., but this is not in all cases enough for the economical extraction of the coal. The mining department should have full discretionary powers. Then large pillars may be blocked out and extracted without having the coal crushed to dust by the weight of the roof. With a strict compliance with Illinois law the pillars will be, at best, 60 ft. square, which is entirely too small. With crushed pillars there will be fines and lower selling prices. For mining costs, thicker pillars are essential.

**T**HE third important change needed is the abolition of the system of paying yardage for narrow work. This practice originated before machines were available. Then a man driving a narrow place and shooting off the solid was at a disadvantage as compared with a man in a room who had little, if any, pick work to do. Under such circumstances the entry man, who had to cut his place and necessarily could not load as much coal, was entitled to extra compensation, which was allowed to him in the form of yardage.

Where the coal is mined by machine it is about as easy to load coal in narrow places as in wide, yet the practice of paying for yardage has persisted to the present time, though now no coal is shot off the solid. Possibly an entryman may have to do more drilling and use more powder

than one who works in a room, but for this he should receive a rate per ton 5c. higher than in rooms, as is customary in other places.

The yardage cost in Illinois is without justification. Most of the mines have entries 9 to 12 ft. wide, and the top coal is left up for roof protection. Conditions for loading are ideal; the height is ample; no timbering is needed; no water requires handling, and every part of the coal face is near the car.

Why should the loader be given a high premium for loading in such places, thus adding considerably to the cost of properly developing a mine? Yardage prices must be abolished if the engineer is not to be unduly hampered in the projection of his working plans.

**L**AST, but not least in importance, the miner must give up his opposition to mechanical contrivances for loading and conveying and must co-operate with the mine owner by every means in his power to make the operation of such machinery a success. To do this he may even have to give up the piece-work system and work on a day-wage basis, for only by such changes can he ever hope to enable his employer to compete with low wages without reducing his own rate of pay.

Illinois miners are not getting too much for a day's work, but they need not hope to maintain the present scale against one scarcely more than half as large unless they will mine coal in such greater quantities per man as will offset the difference in pay. This can be done if every man will do his best to aid in making mechanization successful.

The coal fields of Illinois are unusually well suited for mechanical mining, and the old-time working methods imposed by precedent no longer pay. Modern ideas must be welcomed and not alone tolerated; they must be made effective by the active co-operation of both employer and miner.

**E**XCEPT in a few instances the high-volatile fields of West Virginia and eastern Kentucky do not have such favorable conditions for economical mechanization. Most of the coal is thin in those fields, and usually has one or more bands of slate or bone which must be hand-picked if the product is to be rendered salable. The mountains also press so unequally on the coal pil-

lars that the roof in West Virginia and eastern Kentucky is controlled with more difficulty than in Illinois.

Then too, there usually is a draw-slate which comes down and mixes with the loose coal, all of which militates against the loading of this coal by machinery. In Illinois only the blue band and an occasional sulphur ball have to be picked out of the coal.

If the top coal is left to be recovered when the pillars are retreating, no roof slate will be mixed with the coal and the machine can load without interference. The roof is good and so is the bottom, and the coal is high enough for the operation of any type of loader. The coal seams are flat and the surface likewise, and the overburden is of equal thickness.

## What Illinois Mines Must Have

- 1 -

Deeds permitting recovery of all coal from ground

- 2 -

Repeal of unduly restrictive crosscut legislation

- 3 -

Release from unreasonable charges for narrow work

- 4 -

Co-operative spirit in relation to mechanization

## Use of Pulverized Coal Is Growing

Improvement in the burning of coal which will make it less laborious to handle, more easily stowed in ship bunkers and more efficient in operation will make it a stronger competitor with oil. For this reason the National Coal Association has published a booklet written by H. W. Brooks on "Powdered Coal and the Coal Industry."

In 1924 the consumption of powdered coal was 16,000,000 tons, distributed among industries approximately as follows:

Manufacture of	Tons	Per Cent
Portland cement.....	6,000,000	37.5
Iron and steel.....	3,000,000	18.8
Copper.....	2,500,000	15.6
Power.....	3,500,000	21.9
Other purposes.....	1,000,000	6.2

Today the American totals probably reach 25,000,000 tons, or about 5 per cent of the entire bituminous coal production. The following table on fuel consumption for various types of furnace may prove useful as showing savings in use of pulverized coal and the temperatures attained in the furnace:

Coal Savings and Temperatures with Various Furnaces

Type of Furnace	Hand Fired Coal per 2,240 Lb. of Metal, Lb.	Pulverized Coal per 2,240 Lb. of Metal, Lb.	Average Working Temperature Deg. C.
Reheating for steel..	710-1,220	634	1,370
Reheating, for wrought iron.....	762	538	1,480
Puddling iron.....	2,545	1,830	1,480
Busheling.....	815	478-538	1,425
Malleable iron, melting.....	846	625	1,600
Malleable iron, annealing.....	1,515	405-657	1,000
Sheet and pair.....	336-542	264	985
Sheet annealing.....	426-561	186-224	1,000
Open hearth.....	497*-825*	457-533	1,600
Small forge.....	.....	376	1,200
Galvanizing.....	379	103	700
Rod-heating.....	810	427	1,100
Continuous reheating.....	219-470	123-264	1,150
Spike.....	778	421	1,100
Rotary cement kilns.....	.....	560	1,600
Caustic pot furnaces.....	1,000	812	.....
Steam boilers.....	60†-75†	85	1,450

\* Producer gas fired. † Thermal efficiency in per cent.

In the April issue of *Coal Age*, page 211, it was stated that the L.O.X. plant of the Norton Coal Mining Co. was installed by the Keith Dunham Co., of Milwaukee. The address of the latter company is 110 South Dearborn St., Chicago.



# *Sizing Up the* **TIMBER PRESERVATION** *Problem*

By *L. D. Tracy*

*Consulting Engineer  
Pittsburgh, Pa.*

**M**UCH of the timber in all mines is continually arriving at such a state of deterioration from decay that it is no longer serviceable and must be replaced. Consequently, the production costs will be materially reduced if the timber is preserved by chemical treatment.

With a success that has varied according to the degree of systematic control and to the correctness with which they have sensed the proper methods of treatment, both coal- and metal-mining companies have experimented in the preservative treatment of timbers, using several different methods of accomplishing that end. Doubtless erroneous conclusions, unfavorable to the use of treated timber for mining purposes, have been drawn from these tests.

It is doubtful if many mining officials take the trouble to figure in dollars and cents just where treated timber should be used.

In this article I purpose to present some of the conclusions I have derived from a comprehensive study of mine-timber preservation made under a co-operative agreement between the

U. S. Bureau of Mines and the Carnegie Institute of Technology\* in so far as these results concern the preliminary work which should be done by any mining company which contemplates the extensive use of treated mine timber.

**I**T SHOULD be borne in mind that the timber-preservation problems of the mine operator differ in many respects from those of other users of treated timber. These differences should be appreciated especially by those who are connected with the wood-preserving industry—either as operators of commercial treating plants, manufacturers of preservatives or designers of timber-treating installations—because a type of treatment used for timber intended for surface structures might not be suitable for timber for underground purposes.

This is due to at least two elements which are to be found in most underground workings and which are absent in practically all other operations involving the use of treated

timber: (1) The indeterminate and varying length of time the operator desires the timber to last; (2) the unknown and almost incalculable stresses which ground movement and the pressure and weight of the overhead strata may impose on the timber.

As regards the first of these elements the normal user of treated timber knows the conditions under which he expects to use it; in nearly every case the length of life desired is theoretically perpetual. That is to say, if the treated timber is to be used in a railroad trestle, its desired life would be that of the railroad itself, which may for all practical purposes be considered perpetual. The longer the life of a railroad tie, the better. Structural timbers are expected to last for an indefinite period.

On the other hand, the desired length of life of a mine timber is problematical, depending purely upon conditions best understood by a mining engineer.

**T**HE second of these elements is the cause of the destruction of many mine timbers. In nearly all other uses of timber, where its long life is desired, the stresses to which it will be subjected can be closely estimated. For example, if the timber is to be used as a beam, the live and dead loads it is expected to carry are known and the proper dimensions for carrying that load can be calculated. Or if it is to be used as a sill for a building, the weight which it will have to support is constant, and it is a simple matter to select a timber of the necessary size.

But this is not so true for underground timbers, because a sudden change in roof conditions may bring an unexpected pressure which the timber cannot withstand and which so splits and crushes it that the effect of the preservative treatment, unless

---

**ONE CAN RARELY EXPECT** to make a profit from preservative treatment in the first few years, for the old timber in the mine will keep on failing and have to be replaced by new. Until all the old has been discarded, the full value of the treatment methods will not be felt. Prior to that time both timber and treatment costs will be high. However, the operator may save by the use of cheaper woods, getting the permanence of more durable material by the addition of preservative.

---

\*Bulletin No. 33, "Co-operative Mining Investigations—Method and Costs of Treating Mine Timber: What to Treat and What Life to Expect," by L. D. Tracy and N. A. Tolch. Carnegie Institute of Technology, Pittsburgh, Pa.; 1927.

it is especially thorough, may be destroyed. Or the normal pressure may be so great that even untreated timber will fail from fracture before it will fail from decay. However, timbers are often weakened by decay and then fail from fracture. This, of course, can be prevented by proper preservative treatment.

It is highly desirable, therefore, for any mining company which is contemplating the introduction of the use of treated timber to employ an engineer who is thoroughly conversant with the principles of timber treatment and also with the modern practices and methods of mining to make a study of the problem as it concerns that particular mining company, in order to recommend the method of timber treatment which is best adapted to the conditions found. He should report also upon the probable savings, in dollars and cents, if any, which may be expected from the use of treated timber, and where in the mine its use would be justified and where it would not.

**T**HERE is a time limit which can be determined with a fair degree of accuracy within which the use of treated timber would be uneconomical but beyond which money can be saved by its use. Moreover, timbers

considered, the solubility and life of a preservative in running water, the gases which may be given off by a preservative at the time of a mine explosion or mine fire—all should be fully considered.

By a thorough examination of the mines which will take into account the anticipated annual tonnage, the life of the producing property, the characteristics of the roof, the haulage system used and the method of mining practiced, the best results from the use of treated timber can be planned.

**A** MINING executive who decides upon a policy of timber preservation, especially where the replacement of old timbers in existing workings is contemplated, must realize in the beginning that little definite saving in his timber bills will immediately appear. In fact he should not be surprised to have, at first, some increase in cost because of the additional charge due to the operation of the treatment plant or to the higher price of treated timber, if such timber is purchased in the open market.

The actual saving in the cost of timber per ton of coal mined may not begin to show for several years, or until the demand for new timber to replace old timber which has failed

ber with the exception that in one case it has been properly treated and in the other is untreated, have the same atmospheric conditions. Also assume that the timber sets in place cost \$25 each for the treated sets and \$18 each for the untreated, and that untreated timber in these entries or drifts has heretofore lasted but two years, whereas experience has shown that under similar conditions properly treated timber will last twelve years.

With an interest charge of 6 per cent, the annual carrying charge for the untreated sets will be \$9.81 and for the treated sets \$2.98 each, or an annual saving of \$6.83 for each set. On 150 sets this would amount to \$1,024.50 annually and \$12,294.00 in 12 years, the expected life of the treated timber.

It is not improbable, however, that a few of the treated sets will not last twelve years because of defective timber or improper treatment and therefore will have to be replaced. The extra cost involved, however, will be more than balanced by the additional cost of replacing untreated timbers. It generally is more expensive to remove old timbers and substitute new ones than it was to place the timbers originally.

**T**HEREFORE, mining executives should not conclude that mine-timber treatment is not an economy because no visible saving is shown the first, second or even the third year after the practice has been adopted. Nor must the mistake be made of adopting a half-hearted policy of timber preservation. Treated timber should not be placed here and there in a mine haphazard without definite knowledge as to the type of treatment, the kind of timber treated, its condition before treatment or the particular use to which it has been put. No wonder that some who have undertaken the practice so unsystematically and pursued it so unscientifically have abandoned it in a year or two because a big saving in money has not been evident!

No mine operator would rightly pronounce judgment upon the success or failure of electric power for mine haulage from observing the performance of a system of poorly bonded rails, patched-up motors and badly insulated power lines.

The same principle holds true for an installation of treated mine timber. A stick may fail because it was treated when unseasoned, thus preventing the penetration of the preservative, or it may fail because it has

---

**TIMBERING IN MINES** is intended to be permanent, semi-permanent or impermanent and should be treated either thoroughly, superficially or not at all, according to needs. Where timber is intended to be set in return air and is likely to be scraped by derailed cars, by augers, bars, picks or machines, to have spikes driven into it or to be struck by flying coal or rock, it should be treated in the most complete manner. All timber in traveled roadways is liable to be thus misused, after which it will give lodgment to spores and decay will result. Posts which become crushed, twisted or split afford access to the interior of the wood where the treatment may not have reached. Thus the fungus will feed with contentment on the unpoisoned layers in the heart of the stick.

---

for which a long life is desired require one type of treatment while those whose desired life is comparatively shorter may be effectively treated in a different manner and at a less cost.

Different kinds of preservatives may be better adapted to different conditions: Fire hazards must be

because of decay commences to decrease.

However, the yearly saving can be determined with a considerable degree of accuracy by one familiar with the conditions in a mine which are favorable for decay. As an example, assume that two entries or drifts, each supported with the same kind of tim-



been so trimmed and cut after treatment that the effect of the preservative almost has been nullified. Such failures should not be criterions by which to judge the performance of well-seasoned and properly treated wood. Even the most superficially treated timber, if the treatment has been properly done and the timber handled with ordinary care, should show some good results.

During the investigation, to which previous mention has been made, I either personally inspected the treated timber in nearly all the coal and metal mines in which it had been used or received information concerning it from reliable sources. The lack of definite data relative to the method and cost of treatment, the length of life of treated timber placed underground and the comparative value of treated and untreated timber was noticeable. This was especially true of the data obtained from some of the smaller companies which had purchased timber from commercial treating plants and had placed it in the mine, no one knew where or when. This practice may do an injustice to the use of treated timber, because it will possibly lead to the conclusion "Oh yes! we placed some treated timber in our mine, but it did not cut our timber costs, and we do not think it pays," thus "damning with faint praise" a practice that is really worth while when properly performed.

**T**IMBER treatment, whether at coal or metal mines, should be conducted in a systematic manner, under the supervision of some one who is thoroughly in sympathy with it and who is satisfied with its efficiency and consequent economy. A strong argument for this recommendation is that the average timberman lacks a knowledge of the principles involved in timber preservation. In fact, such a knowledge is not to be expected, for timber preservation is to a certain extent a specialized industry and mining operations have but rarely practiced it.

It is a well-established fact that the sole cause of the decay of timber is the action of certain fungi which use the woody substance as a food supply. If that food can be poisoned by the impregnation of toxic chemicals, the fungi cannot live and therefore the timber will not decay.

When the wood is properly treated, the preservative forms a toxic seal which should envelop the entire timber. If this seal is broken, as it may be by cutting, trimming, bruising or

**F**UNGUS needs for prolific growth damp air with plenty of carbon dioxide. The return current supplies those characteristics far more generously than the "intake air, fresh from the surface," of the mining law. So care should be taken either that return air be no more contaminated than is necessary or that it travel but a short distance through timbered roadways. Many mines that have made such provisions have greatly reduced their timber costs. Timber preservation can be pursued in two directions: (1) by removing conditions favoring timber decay and (2) by making timber resistant to such influences.

perhaps by spiking, a non-poisoned surface is then exposed which will offer a feeding place to fungi and a point of consequent decay. Spores also may enter mine timber by checks and cracks caused by ground movement or the abnormal roof pressure resultant on the removal of coal.

**I**N a mine in Colorado a number of drift timbers treated with a well-known preservative were installed in a hot, damp entry. After a year some of the posts began to decay at their lower ends. An inspection revealed the fact that the timbermen had cut off in each case the foot of the post and had not applied a fresh coating of preservative to the exposed surface. Those timbers which had not been cut were in perfect condition.

Where inferior grades of timber can meet the mechanical requirements of strength and toughness, they will serve as well as the more costly timber of the higher grades. In such a case a timber-treatment engineer could possibly make a saving which might not occur to the mine superintendent.

It has been previously stated that mine timber requirements vary greatly and that the method of treatment should be adjusted to meet these varying requirements. As an illustration, the treatment of shaft timbers, which are expected to last for the life of the mine, need not necessarily be the same as those for drift sets, which may serve for only a few years; the treatment cost should vary in proportion.

Again, timber in haulageways may

need better treatment with a deeper penetration, in order to withstand the wear and tear due to derailed trips, swaying cars and small side clearance, bruises due to flying debris from face shooting and other rough usages, whereas the timber in an unused parallel entry such as an aircourse or manway may be efficiently treated by a less expensive process.

The ventilation of a mine also plays an important part in the economic life of timber, as was well illustrated in a mine in New Mexico which was recently visited. Two parallel entries about 50 ft. apart were timbered at the same time with the same kind of timber and under the same roof conditions, but the timber in neither entry had been treated.

**O**NE of these entries had a volume of fresh air sweeping through it which had not come in contact with fungi and which, consequently, did not carry any spores. The timbers which were inspected at the time of this visit were all sound and in good condition, apparently as serviceable as when first placed. The other entry was a main return aircourse, and the air current was humid and warm and, furthermore, had traversed that part of the mine containing more or less decayed timber. Naturally, spores were collected and carried in this return air and deposited on the timber under the most favorable conditions for germination and growth; with decay as the inevitable result. In fact many of these timbers were so soft that a knife blade could be sunk to the handle in them.

A still further example of the effect of ventilation upon the life of timber is shown by the condition of some timber sets in a Colorado mine. In the warm, moist air of an incline which was used as a return the timber decayed rapidly until the air current was diverted by a cave of the roof and fresh air was drawn in. During this period the timbers resisted decay fairly well, but when normal ventilation was restored and return air again came up the incline, decay renewed its attacks on the timber.

It is not improbable that a study of the ventilating system of the mine which takes into account the temperature, humidity, quantity and freshness of the air supply, its path through old workings together with the general timber conditions, might reveal means of rearranging the air currents so as to decrease or at least retard the rate of decay of the timbers.

# REDUCE MENACE

## *Lay All Cards*

By H. S. Gilbertson

Director of Personnel  
Lehigh Coal & Navigation Co.

THE principles advanced in the preceding articles of this series have all been tried out with a measure of success in the personnel procedure of the Lehigh Coal & Navigation Co., the oldest of anthracite producers, which maintains a mining organization of between 9,000 and 10,000 employees, distributed over eight collieries, in the Southern and Middle anthracite fields.

The position of this company is such as to give rise to a great variety of personnel complications. Extremely complex mining conditions are the occasion of frequent technical differences between management and men. Established traditions play a very important part in the outlook of the mining organization and the communities. Anthracite coal is practically the sole local industry. Unionization is complete.

Given a background of this kind, personnel administration in its inception called primarily for a loosening-up process. There were—and still are—prejudices to be overcome and confidences to be established. It must be recognized that in such an industrial layout the human units are played upon or molded by a thousand and one different influences.

IT HAS always seemed to the writer that what the procedure called for was not a matter of setting up what have perhaps come to be regarded as standard personnel services—an employment office, pensions, group insurance, and the like—but first of all an analysis of each per-

sonnel problem as it arises in the light of all the facts. The "services" might sometimes be called into being, but they would be incidental means to an end. The solution would often take the form of improving the functioning of the ordinary day-to-day machinery of operation. In this view personnel administration has almost

unlimited scope. It may approach its ends through the mining engineer, the mechanical department, the accounting department, as well as the direct operating officials, or it may go outside the mine organization to the newspapers, the local civic organizations or outside individuals.

If the personnel objectives and policies of this particular company must be reduced to phrases, they would be three in number and closely akin: the open book, the open door, and the open mind. The management for some years past has responded freely to requests for information concerning its operations. But the definite personnel and public relations program entered upon four years ago meant that the initiative in this publicity policy shifted from the public to the management. It was no longer a matter of satisfying occasional public curiosity but of going out with the facts and practically compelling the organization and the public to be informed. It was felt that secrecy and ignorance were positive dangers.



H. S. Gilbertson

### Three Objectives

If the personnel objectives of this company were to be reduced to phrases, they would be three in number and closely akin: the open book, the open door and the open mind.

sonnel problem as it arises in the light of all the facts. The "services" might sometimes be called into being, but they would be incidental means to an end. The solution would often take the form of improving the functioning of the ordinary day-to-day machinery of operation. In this view personnel administration has almost

THE principal medium of information is a four-page monthly paper which has dealt with any number of supposedly delicate subjects. Profits from the sale of coal, costs, etc., have been published frequently, and from several standpoints; the policies and actions of local union leaders have been criticized without heat or per-

sonalities but with the utmost fullness and frankness; responsibility has been placed for serious accidents; the position of the company toward local political issues and toward the participation of company executives in politics has been freely discussed. The paper aims to acquaint the organization from top to bottom with the innermost significant details of the business, not so much by preachment as by presentation of facts. It has courted criticism on any phase of management, and has received it in rather abundant measure.

Does this publicity pay? Four years ago the announcement of this policy was received with skepticism. Many felt, and said, in one way or another, that "there was a trick in it." But a succession of actual events, confirming the statements and judgments of the management, and discrediting those of some of its critics, gradually gained favor and authority for the policy. It is possible to sense the passing of many of the old suspicions. Irresponsible and defamatory rumors whose effect in the past



# OF LABOR UNREST; *on the Table*

worked infinite harm are quickly nailed. The management speaks, on every live issue, directly to every one of its individual employees who cares to hear, over the heads of any who might be inclined to distort the facts. In all these four years there has never been a come-back which would cause the management to feel that it has said too much.

The management, having established this policy of publicity and frankness, sought to secure a reciprocal attitude on the part of the supervisory forces. It has been impressed upon foremen and others in authority that information concerning every matter which has to do not only with the attitudes, actions and welfare of the men but every phase of operation is a matter of company concern and is, in fact, company property. And by "company" is meant not simply the management or the board of directors but all those who have a definite stake in the welfare of the business.

THE reciprocity idea and its effects are perhaps best illustrated by the detailed accounting for mine costs. These costs, of course, originate under each assistant (section) foreman and are built up mainly from his time-book record. There was a time when the duty of giving up detailed information was somewhat resented. But of recent years it has been handed back to the operating men in analytical form as a measure of individual achievement and as a guide to further progress. The habit of secretiveness has been largely overcome.

And then, there is the community to be thought of, something rather peculiar to coal mining which most industries know little about. It is something apart from the mine organization, even though the adult male personnel of it is about nine-tenths the same. As a community, this aggregation of mine workers and their friends naturally thinks, talks and acts more freely than in the employer and employee relationship. Organized in boroughs and school

districts, it can tax the property of the coal company or companies, which constitutes the source of from 40 to 96 per cent of the local tax revenue in the different districts.

What should a coal company do in the premises? The old way in some localities was to crack the whip; one of those practical, direct policies which sometimes brought quick returns and an ultimate harvest of ill-will and retaliation. The new way is, again, publicity. Local taxation is

previous appointment and without knocking. Every year hundreds of individual employees avail themselves of this opportunity, but since there are about three hundred working days in the year, the visits are not burdensome. There are some "pests" who over-stay their welcome or come too often, but these are exceptional; the general run of visitors state their business and leave promptly. The greatest benefit accruing to the personnel situation from this practice lies not in the fact that certain particular individuals make these visits but that the hundreds or thousands who do not come in have the feeling that they *could* do so if the occasion arose.

These individual visits, both actual and potential, favor the flow of essential information in both directions.

---

## The Open-Door Policy

Any individual, on any mission, however trivial, practically at any time is privileged to walk in on the director of personnel without previous appointment and without knocking. Every year hundreds of individual employees avail themselves of this opportunity. The general run of visitors state their business and leave promptly. The greatest benefit accruing to the personnel situation from this practice lies not in the fact that certain particular individuals make these visits but that the hundreds of thousands who do not come in have the feeling that they *could* do so if the occasion arose.

---

virtually a factor, and a very important one, in labor costs. Costs determine prices, prices determine markets and markets determine the volume of employment and personal income. The mining community is beginning to see this, as well as the general truth that the fortunes of the coal company are in nearly every respect identical with those of the community. Here again the teachings contained in company statements some time since have been verified by the recent depression in the anthracite market.

AN OPEN-DOOR policy has been adopted. Any individual, on any mission, however trivial, practically at any time is privileged to walk in on the director of personnel without

Out of them have come opportunities to know at first hand the psychology of the workers, which formerly came to the main office at second or third hand, and, of course, with a loss of personal color. A new and detailed viewpoint is brought to bear on the problems of the individual worker through this channel. To anyone who, with some exercise of imagination, will read between the lines of the tales and complaints of those individuals a rich fund of information—partly fact and partly fiction—is available, upon which to base recommendations for constructive measures.

Thus it will appear that a good deal of the personnel program relates to the building up of an atmosphere of confidence in company policies. To the open book and the open door add

the open mind. It is one of the theories of the management that eight or nine thousand heads are better than one or half a dozen. At any rate, some hundred or more good heads there must be if the thousands are to be brought into anything approaching harmony in any operating program. Furthermore, no industry, probably, suffers more from the tyranny of tradition than does coal mining, and no part of the industry more than some parts of anthracite. And the closed mind is a poor tool with which to go out and meet the exacting requirements and new conditions which face the industry. It was this thought that dictated the inauguration of foreman training three years ago, and was elaborated in the foreman's manual of mine management. This booklet expressed the opinion that the new type of mine executive would distinguish himself:

By contributing information of all sorts which would be available to the company as a whole.

By seeking advice.

By willingness to accept criticism.

By interpreting and executing orders in the spirit in which they were issued.

By relieving the general office of the need of following up.

By contributing as much as possible to efficiency and economical operation, beyond the point where your special responsibilities end.

There was organized during the long strike of 1925-1926 a uniform series of two-hour meetings at each mine every two weeks, dealing successively with various phases of costs, production, safety, selection of men, discipline, instruction and similar topics. These meetings assembled a group consisting of the superintendent, inside foreman and his assistants. A line of discussion was marked out by a series of questions. After the meetings at the several mines the net result of the decisions arrived at were sent in to the personnel department, which summarized the results of each group of meetings and sent this summary back to all participants.

**T**HESE discussions developed many facts of value to the people at the collieries and to the general management. In some instances interest in the discussions induced the members of the groups to devote to them double the allotted time and more. On the other hand, the comparative failure of the conferences at one or two points revealed a need of strengthening the leadership.

For two winter seasons a class, the membership of which is vol-

untary, has been conducted once a week for the benefit of prospective or would-be foremen. This class has had the benefit of the direction at each of its sessions of the men in the organization who are best qualified to deal with the particular subjects: foremen who have been especially successful along some special line, superintendents and heads of departments. The subjects taken up in this way are the same as those dealt with in the earlier foremen conferences.

Do these foreman conferences really train?

They help, especially if taken in connection with the whole scheme of things of which they are one phase. They have not imparted vast quantities of original information but

service it now renders is advisory and supervisory. The veto power may be, but never has been, used under the new system.

**N**OT the least of the functions of a personnel department in a unionized organization—and, in fact, it sometimes looms exceedingly large on the horizon—is a service of mediation. Unionization in one sense is a simplifying, but in far more senses than one a complicating factor. The situation can perhaps best be expressed by saying that the executive is confronted with a double and often conflicting system of allegiances and leaderships acting upon the men—the original company affiliations on the one hand, and the union on the

## Reciprocity Reduces Conflict

It seems permissible to say that by reason of the policy of bringing the facts of each company and individual situation out into the open and by reason of a sustained effort to appreciate the point of view and interest of contending parties the area of conflict has been materially reduced. The "take-it-or-leave-it" ultimatum, which in some organizations used to be about as characteristic of one side as of the other, has by mutual implied consent pretty much passed out of vogue.

they have very definitely stimulated thought concerning the business management of a mine and the handling of men. This is shown to be the case in detailed ways which would not make especially interesting reading. It is difficult to trace improvements in these fields to their exact source.

Back of all this procedure has been the purpose of making the foremanship a bigger job—or, rather, aiding the foreman to make it so by reason of his own better grasp on his job and the strength of the organization which he directs. This has involved something of a reversal of former policies, as, for example, in the matter of hiring men. Following a prevailing custom in vogue during the war in many industries, the actual hiring had been given over to a central employment office as a method of reducing labor turnover. The system was effective but it impaired the leadership and the responsibility of the foreman. The central employment system has been retained but the

other. At the same time union protection means that serious personal complaints—and many that are not serious or even actual—come to the surface where they can be dealt with. It seems permissible to say that by reason of the policy of bringing the facts of each company and individual situation out into the open and by reason of a sustained effort to appreciate the point of view and interest of contending parties the area of conflict has been materially reduced. The "take-it-or-leave-it" ultimatum, which in some organizations used to be about as characteristic of one side as of the other, has by mutual implied consent, pretty much passed out of vogue.

It would be pleasant to prove, statistically if possible, that this whole personnel experiment has produced sweeping improvement in operating conditions. But influences of this kind do not seem to lend themselves to measurement or to being completely segregated from other influences that may be at work.





# BOONVILLE *is Proving Ground* for New STRIPPING PROJECT

THE determination of the Northern Illinois Coal Corporation to use open-cut mining as the rejuvenating agent in large-scale recovery from the moribund Braidwood - Coal City - Wilmington area southwest of Chicago is based upon the success won in stripping operations by its subsidiary organization—the Sunlight Coal Co.—in the Boonville (Ind.) district. What has been planned for the newer development in northern Illinois has been proven over several years in southern Indiana, where, under the direction of Capt. T. C. Mullins, vice-president and general manager of these allied companies, the textbook ideal in stripping has been realized and even improved upon in practice.

In theory stripping is simplicity itself. All the work is at all times exposed to view. Less labor is required. There are no problems of ventilation, of timbering, of underground transportation and the scores of other questions incident to shaft, slope and drift mining to vex and perplex. Close and adequate supervision is easier. But, as experience has so painfully taught, this delusive simplicity has wrecked more than one venture in open-pit mining. More than one shovel has been landlocked



T. C. Mullins

Vice-president in charge of operations of the Northern Illinois Coal Corporation and its affiliated organizations, was born in Fayetteville, Ark., Feb. 27, 1885. He was graduated from the University of Arkansas with the degree of Bachelor of Civil Engineering in 1906. For several years he held various engineering positions, going to the Sunlight Coal Co. as manager in 1915. Later he became vice-president and when the Sunlight was merged with the properties of the Illinois corporation his jurisdiction over operations was extended to cover all mines of the Hitt interests. During the World War Mr. Mullins served as captain in the Engineer Corps of the U. S. Army and now holds the rank of major in the U. S. R. C. He also has been mayor of Boonville and is prominent in the business life of southern Indiana.

as a result of improper disposition of the spoil banks, more than one operator who prospected with a shovel has come to financial grief.

How, then, is it possible, as was done in the case of Madden or No. 5 pit of the Sunlight company, to handle 4,217,000 cu.yd. of overburden and produce 845,600 tons of coal with one unit in less than two and one-half years and yet complete the job within ten days of the time originally planned before a shovel was put upon the property? The answer is management which makes the engineering department really responsible for the operation and gives that department the authority which enables the engineering staff to function effectively and efficiently.

AT THE present time the Sunlight operations in the Boonville district include two strip pits and one mechanized shaft mine. The Boonville office also serves as operating headquarters for the new strip plant in northern Illinois. Duplicates of all operating data on the Wilmington project, which was described in a recent issue (*Coal Age*, Vol. 33, p. 278), are sent to the Boonville office.

The Boonville strip mines, known as Sunlight No. 3, and Sunlight No.

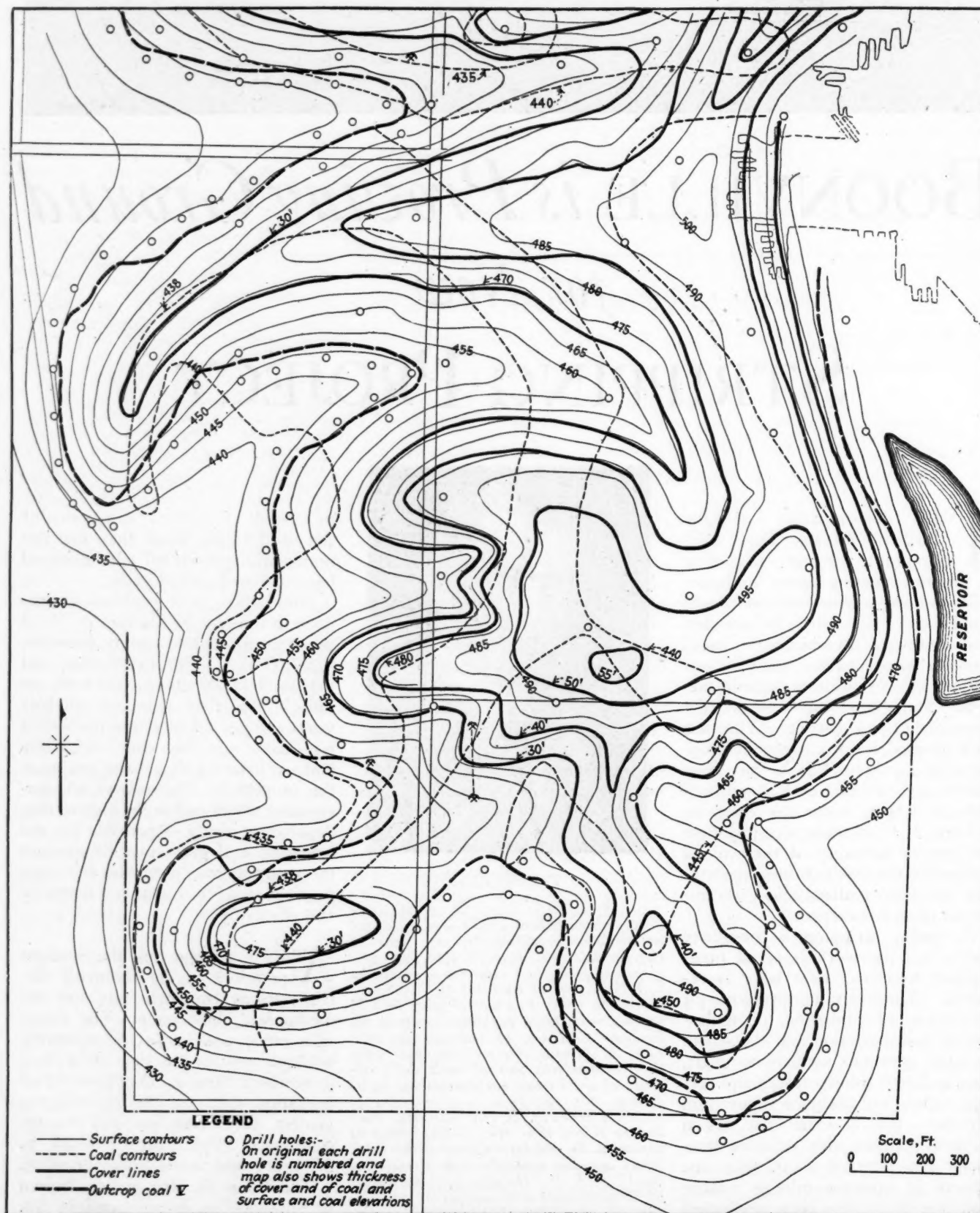
8, or the Polk Patch development, are in the Indiana No. 5 coal seam—the seam which furnishes over 65 per cent of the output of the state at the present time. The No. 3 mine is about two miles northeast of the town and covers an area approximately one-half mile square. The overburden is from 25 to 50 ft. thick and

consists of sandstone, shale, slate and surface soil. The plot is estimated to contain several million tons of recoverable coal. The coal is 6 to 8 ft. thick.

Preliminary work was started in

Fig. 1—Contour and cover map, southern half of Polk Patch mine

January, 1927, and the actual removal of the cover began in June, 1927. The overburden is being stripped at an average daily rate of 6,000 cu.yd. by an 8-yd. 350 type Marion electric shovel mounted on four-wheel trucks and running on standard-gage 110-lb. rails. The shovel is operated three 8-hr. shifts.





Coal is loaded out at an average daily rate of 1,200 tons by a type 36 Marion steam shovel with a 1½-yd. bucket; the loader is operated one 8-hr. shift per day.

The No. 8 mine lies about 3 miles northeast of Boonville and covers an area approximately 1 mile long and ½ mile wide. The overburden on this property is of the same general character as that covering the No. 3 mine coal and ranges from 20 to 55 ft. in thickness. A type 350 Marion electric shovel mounted on caterpillar treads is used to uncover the coal. This machine, working three shifts, averages 7,000 cu.yd. per 24-hr. day. The coal, which ranges from 6 ft. to 8 ft. 4 in. in thickness, is loaded directly into railroad cars by a type 37 Marion electric shovel with a 1½-yd. dipper. The quantity of coal loaded at Polk averages 1,500 tons per day.

As at Wilmington, actual development was not undertaken until after the most careful surveys and tests. At the No. 8 mine, for example, prospecting began in February, 1927, when the first drill hole was sunk, and 300 holes were drilled before it was decided to go ahead with further work. Surveys were started in March and the topographic field work was finished in October. The data developed on the south half of the Polk Patch property are shown in Fig. 1.

With the property accurately surveyed and mapped to show outcrop, surface and coal contours and cover lines, the next step was the determination of the most efficient and economical method of stripping the overburden. It is here, perhaps, that management plays its biggest rôle in planning down to the last detail—in so far as such things may be planned in advance—the actual working of the property. As a basis for this work the territory is divided into 50-ft. squares. Stakes are set on these squares on actual co-ordinate points with the co-ordinate locations painted on the stakes. Levels are taken on the ground at each stake. A co-ordinate map is then laid out in squares corresponding to the squares in the field with surface elevations shown at the corner of each square.

Using this co-ordinate map as a working sheet the engineering staff then lays out the method of working, determining the length and direction of each cut, where box cuts shall be made, when a cut shall be narrowed to avoid the danger of landlocking shovels with spoil, when and where cuts shall be widened to straighten

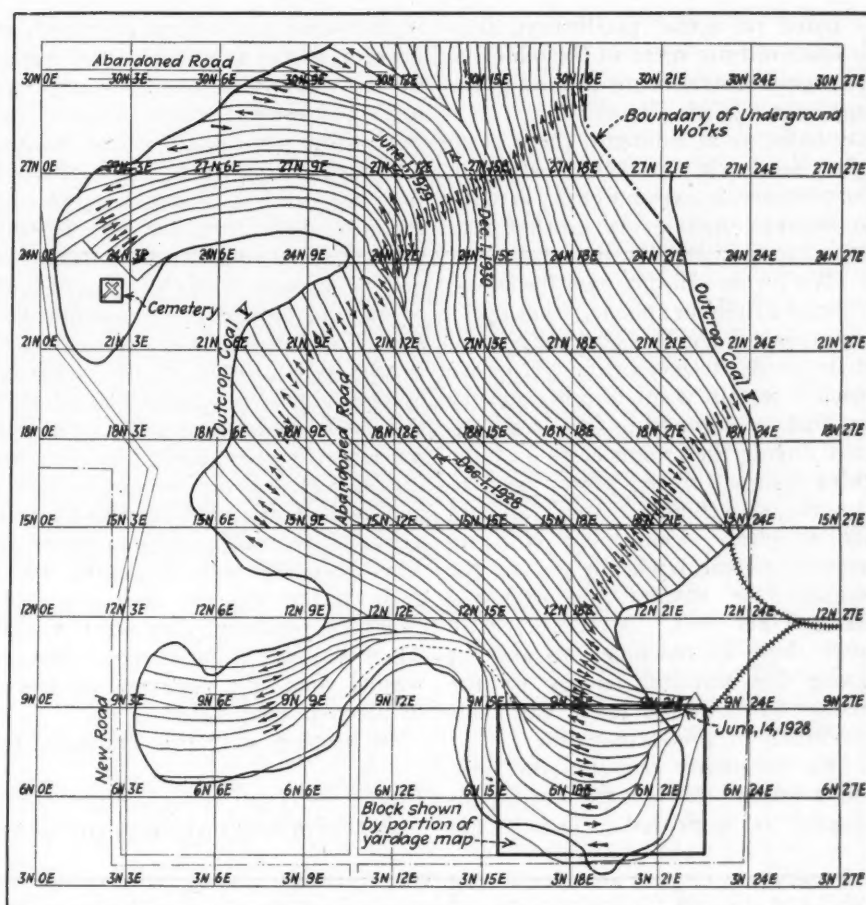


Fig. 2—Co-ordinate map with working plan for shovel outlined

out curves and the rate of progress to be attained. Several tentative working plans may be drawn before a final layout is agreed upon—but whatever resort there may be to “the trial and error” method of procedure is confined to the drafting board. The experimental workings are laid out on paper and revised in the light of the knowledge of the coal and the topography of the area to be worked and the accumulated experience of past records of performance. The drafting room—not the strip pit—is the laboratory.

When what seems to be the best plan for recovery has been reached by the engineering staff, the results of its studies and planning are plotted out as shown in Fig. 2 and this co-ordinate map becomes the progress sheet against which actual daily operations are checked and upon which the record of daily progress is plotted to make certain that the development is moving along the lines and at the speed planned by the management. Nothing is left to chance but the weather and apparently, as the record of time accomplishment at the Madden tract showed, even the possibilities of weather interference are dis-

counted in fixing the rate of progress in recovery.

Cuts for the shovel are staked out on the property so that there shall be no excuse for failure to work the territory in accordance with the plan mapped out by the engineering staff. The daily progress in stripping is entered upon the co-ordinate map. This check, as is shown in Fig. 3, tells the position of the shovel at the end of each shift and thereby gives the management a direct and certain check upon actual daily developments.

The data on development are derived from daily logs of shovel performance. These logs show the state of the weather, condition of the pit, estimated cubic yards stripped, tons of coal uncovered and a record of shovel operations. This record gives the time actually spent in digging, the number of swings the shovel made, the number of moves made, the length of each move and the total face advance for the shift. The record also analyzes non-digging time and details the causes of non-productive time.

Naturally considerable stress is laid by management on keeping non-productive time down to a minimum. There are mines where time lost by tonnage workers is taken lightly by management on the fallacious theory that because the compensation earned

is based on actual production, non-productive time spent in the mines by tonnage workers means no loss to the employer. With all operations on a day basis, as at Sunlight, there is no room for such mistaken ideas. On the contrary, a constant effort is made to impress upon every worker that minutes mean dollars.

"We try to sell our men the idea," Captain Mullins explains, "that every minute lost is the loss of a ton of coal at the going market price. After we reach a certain point in output every ton that we can add to that base tonnage during the month costs only the extra charge for the power used to run the shovel and a small amount for supplies. Our labor cost remains the same while the greater the tonnage the smaller the overhead charges per ton. Moreover, with work done by machine, we are not taxing the physical energy of the worker when we ask for a reasonable maximum of productive time.

"By constantly stressing this idea that a minute lost is a ton lost, maintenance is improved. Delays are

traced down and efforts put forth to prevent, as far as possible, their repetition. Minor adjustments are not neglected and thereby allowed to grow into sources of major delays. The men on one shift realize that, if they are careless, that carelessness is going to show up in the logs of succeeding shifts in greater lost time.

"If the average market price of coal is \$2.50 per ton, every swing that the shovel could make and didn't is practically \$2.50 lost. If the superintendent climbs up on the platform of the shovel and engages the men in a ten-minute conversation, that ten minutes of talk has cost us nearly \$25—and at the going market value of conversation the talk is seldom worth it. There may be times, of course, when such conferences are necessary, but, generally speaking, they are not, and when we place a flat money value on wasted time, idle conversation has a tendency to evaporate."

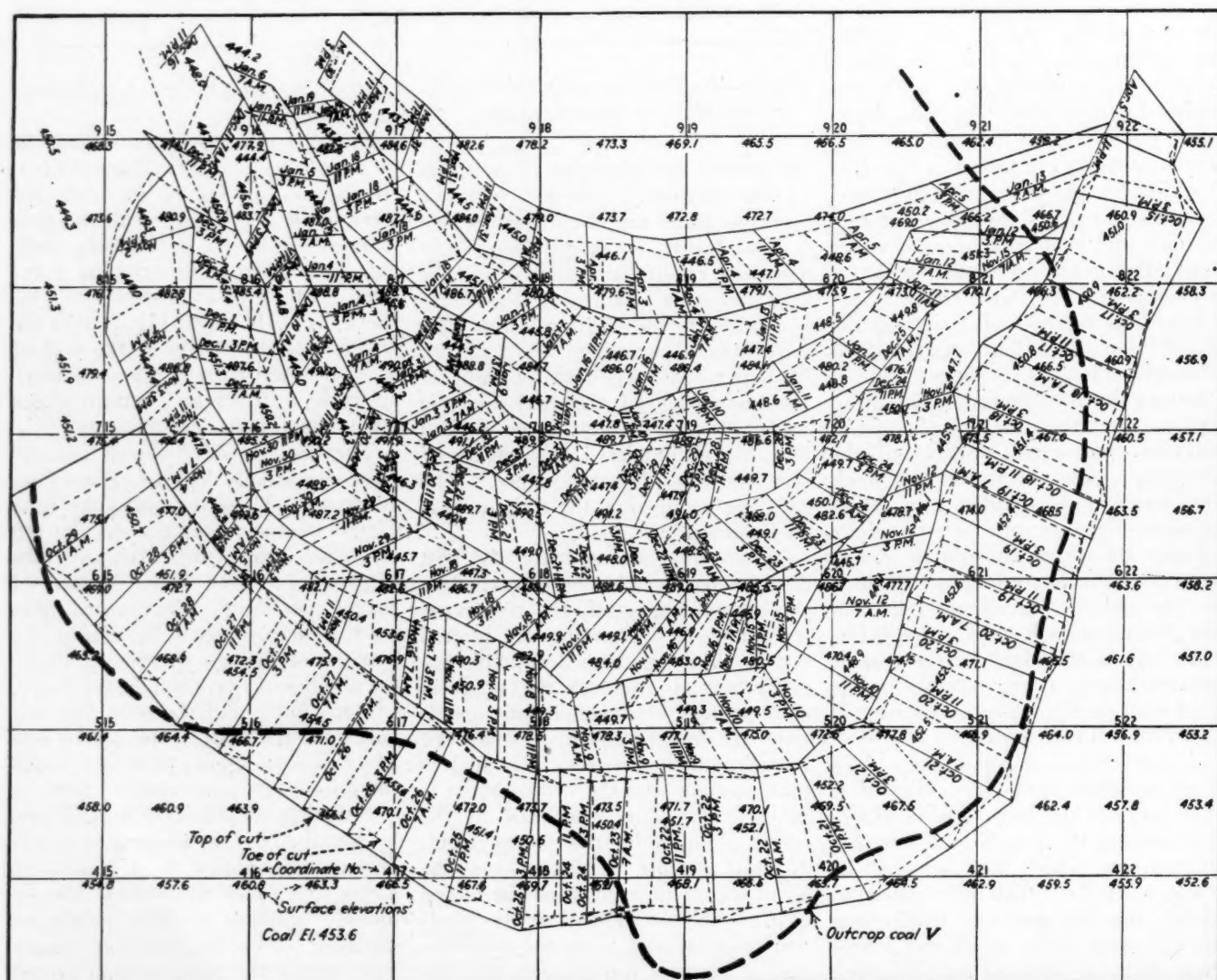
In keeping with this emphasis on

the importance of minutes, checkers are employed to keep the shovel logs so that the shovel men may not be required to take time to compile such data. The fact that these records are being made by an employee not part of the shovel crew also has a decided psychological effect upon the crew and increases efficiency. The checkers at Boonville are students drawn from an engineering school at Evansville where the "co-operative" system under which students spend part of their time in class and part working in industry, is in force.

In addition to the time study data the daily log also shows a sketch of the face location. In measuring face location the checker measures the distance from any three stakes to each corner of the pit. He also measures the horizontal distance between the top and bottom of the bank, the width of the face on the top and on the bottom, the distance the face is advanced and the height of the bank on both sides of the face at the end of the shift.

The horizontal measurements of

Fig. 3 — How shovel progress is checked in daily on co-ordinate map







*Channel Cutter at Work at Boonville Strip Plant*

both the top and bottom of the face at the end of the shift are reproduced on the co-ordinate map. The top and bottom areas of the excavation are then outlined on the map, measured with a planimeter and averaged. The average area is then multiplied by the average of the height of the bank at the beginning and at the end of the shift. This calculation gives the total volume removed in the shift.

Once a month the cut is measured by the engineers of the company and levels are run on the coal. In a month's operation, the records show, the engineers' figures and the estimates made from the reports of the checkers never have varied 5 per cent. The maximum variation was 4.72 per cent; the minimum, 0.07 per cent and the average, 3.15 per cent. These percentages cover operations at both pits.

A monthly average of 153,397 cu.yd. has been handled at these pits. The minimum handled in any one month has been 133,860 cu.yd. and the maximum, 185,009 cu.yd. In the month when the maximum yardage was handled the shovel was digging 79 per cent of the time the pits were working; in the month when the smallest yardage was handled the digging time was 52.7 per cent of the total. The average digging time was 65.3 per cent of the total operating time.

The data from the daily logs are carried forward in monthly summary sheets which give a cumulative picture of the accomplishments of each shift by days and for the month. In March, 1928, for example, the monthly summary for No. 8 showed an estimated excavation of 178,871.4 cu.yd. of cover and an actual excavation of 174,976.0 cu.yd.—a difference

of 2 per cent between estimated and actual figures. During that month the shovel was digging 415 hr. and 33 min., or 64.6 per cent of the time the crews worked. Eighteen hours and fifty minutes was used in moving the shovel. Electrical troubles caused delays totaling 7 hr. and 36 min.; mechanical delays, 35½ hr.; power interruptions, 1 hr. and 47 min.; other delays, 168 hr. and 54 min. The shovel made 26,071 swings, or an average of one swing each 57.38 sec.

Besides the Marion shovels, the equipment at No. 3 includes a Sul-

livan Iron-clad channel cutting machine, a Loomis electric drill and a Sanderson gasoline drill. At the No. 8 plant, in addition to the shovels, drills and Sullivan air compressor, the equipment includes a Vulcan 40-ton steam locomotive and a Davenport 30-ton gas-electric locomotive and a caterpillar tractor for hauling and shifting. Last month the plant equipment was augmented by the installation of an L.O.X. plant with a capacity of 40 liters per hour.

Power to run the equipment at both mines is purchased from the local electric light and power company at Boonville and is stepped down from 13,200 volts a.c. to 4,000 volts d.c. for operating the type 350 shovels and to 440 volts for the type 37 shovel. There are three 150-kva. Westinghouse transformers at No. 3 and three 200-kva. General Electric transformers at No. 8. The latter station also has three 50-kva. transformers for stepping down the power for the loading shovel. The system of delivering power to the machines from laterals from the main power line of the substations is similar to that used at Wilmington and described in an earlier issue.

For night work the pits are lighted with large searchlights mounted on the excavating shovel. These lights give the necessary illumination around the machine.

The engineering work at the Boonville plants is in charge of Otis Bledsoe.



*Visitors Embark for Underground Mining School*

A group of school teachers preparing to take a trip to inspect the No. 6 mine of the Stag Canon Branch, Phelps Dodge Corporation, Dawson, N. M. The party is in charge of W. D. Brennan, manager, assisted by several mine officials and employees. The inspection trip is an annual affair, primarily intended to give educators and others interested an opportunity to see how coal is mined.

# Disabling Accidents

## Cut in Two

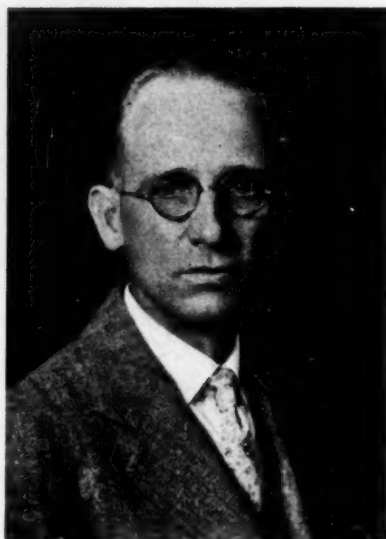
**D**OES increased production mean greater safety? That depends entirely on the source from which increased production is sought, whether from elimination of lost time or needless motion on the one hand, or from merely speeding up, overloading and taking chances on the other. Not without reason do we talk about a "breakneck speed" and a "lazy man's load."

Larger output is best assured by reducing time waste. In a broad sense what is meant by an accident is something that happens that should not happen. The failure to act as planned may be due to a broken part on a machine, a car off the track or a mine explosion. Whatever it is it interferes with schedule, it lays men idle, it delays operation, it puts equipment out of production, and this it does even though it may injure no one.

Safety practice, which is a methodical manner of procedure, established with the idea that every person shall so conduct himself that he will be able at all times to perform the task before him and that everything shall be so constructed and used that it will do without failure that for which it was designed, increases production and lowers costs.

**I**N SHORT, safety is to be sought for its economic advantage to the company and the employee, altogether apart from its humanitarian value. A safe mine is likely to make the best use of its equipment and to have the lowest tonnage outlay. An unsafe mine has only two certainties, low production and high costs.

At Grant Town, W. Va., D. L. Brown, superintendent of the Federal mines of the New England Fuel & Transportation Co., has diligently sought methods of reducing the accident rate at his mines and incidentally has found that the safety campaign has aided his efforts to increase production and lower costs. The manager and his safety engineer



D. L. Brown

have in mind the same idea—to plan for certainty of operation. No captain wants the wrist pin of his engine to break at sea and no mine superintendent wants cars to be piled up in his entries. Mr. Brown finds that W. H. Forbes, the safety engineer, has helped him to get out cheaper coal and more of it than could have been attained without that co-operation.

But this production efficiency is a byproduct usually unsuspected, and it was not the purpose of the company when the safety campaign was started by which the number of serious and fatal accidents was reduced in one year in No. 1 mine by 29.2 per cent. In 1926 there were 82 such accidents and in 1927 only 58. In the first year an accident occurred for every 10,778 tons of production and in 1927 for 17,029 tons, a serious accident being one that incapacitates a man for eight days or over.

**O**NLY in the closing half of 1927 did the mines have a safety engineer and in those last six months the number of serious and fatal accidents in Mine No. 1 was 45.9 per cent less than in the first six months. The betterment in the same period at Federal Mine No. 3, Everettville,

W. Va., was 46.5 per cent, the accidents due to the mine explosion being excluded.

In Table I are shown the causes of serious accidents and fatalities during 1926 and 1927 in No. 1 mine, those for No. 3 being available only for 1927. But first of all it should be said that the coal is from 8 to 9 ft. thick and the cleavage is well marked, as is characteristic of the Pittsburgh seam. Perhaps this is why at the working faces the falls of coal from the face exceeded in 1926 those from the roof-coal and slate and in 1927 were as numerous as from the latter cause.

Table I—Classification of Causes of Serious and Fatal Accidents, Federal No. 1, Grant Town, W. Va.

	—1926—		—1927—	
	No.	Percentage	No.	Percentage
<i>At Working Faces</i>				
Falls of coal from face.....	10	12.2	6	10.5
Falls of roof-coal and slate..	6	7.4	6	10.5
Mining machines.....	3	3.6	4	7.0
Mine cars.....	6	7.4	3	5.2
Locomotives.....	0	0.0	0	0.0
Falling timber.....	0	0.0	1	1.8
Tools.....	2	2.4	1	1.8
Electricity.....	0	0.0	0	0.0
Handling material.....	3	3.6	2	3.5
Coal flying from face.....	0	0.0	2	3.5
Animals.....	0	0.0	0	0.0
Miscellaneous.....	2	2.4	1	1.8
Totals.....	32	39.8	26	44.8
<i>On Haulways</i>				
Falls of roof coal and slate..	2	2.4	2	3.5
Mining machines.....	4	4.9	6	8.7
Mine cars.....	17	20.8	10	17.6
Locomotives.....	5	6.1	4	7.0
Falling timbers.....	1	1.2	0	0.0
Electricity.....	0	0.0	3	5.2
Tools.....	2	2.4	1	1.8
Handling material.....	1	1.2	0	0.0
Animals.....	0	0.0	1	1.8
Miscellaneous.....	11	13.5	1	1.8
Total.....	43	52.5	28	48.3
Total outside.....	7	8.5	4	6.9
Grand total, inside and out.	82	100.0	58	100.0
Percentage inside.....		91.5		93.1
Percentage outside.....		8.5		6.9
<i>Inside and Out</i>				
Falls of coal from face.....	10	12.2	6	10.3
Falls of roof coal and slate..	8	9.8	8	13.8
Mining machines.....	7	8.6	10	17.2
Mine cars.....	23	28.0	13	22.4
Locomotives.....	5	6.0	4	6.9
Falling timber.....	1	1.2	1	1.7
Tools.....	4	4.9	2	3.5
Electricity.....	0	0.0	3	5.1
Handling material.....	4	4.9	2	3.5
Coal flying from face.....	0	0.0	2	3.5
Animals.....	0	0.0	1	1.7
Miscellaneous.....	13	15.9	2	3.5
Total inside.....	75	91.5	54	93.1
Total outside.....	7	8.5	4	6.9
Total inside and out.....	82	100.0	58	100.0

Accident prevention is not a one-man job, and W. H. Forbes has not tried to make it that. He seeks the



co-operation of every man on the job. To get that a Safety Club, to which every one belongs, has been formed. Safety rules have been established by this club and violations of the rules are punishable by fine, as provided in the by-laws. The rules apply to everyone. Mr. Forbes or Mr. Brown is as subject to fine as anyone, and as the rules are many and not always kept in mind they find it difficult to avoid being hauled before "Kangaroo Court" and compelled to pay the small sum which the rules demand—about 50c. for each offense. The club members got so enthusiastic they wanted to make the fines more salty. The officials believed that the popularity of the court would be jeopardized if they were to attempt to "make the punishment fit the crime," as Gilbert says in "The Mikado," and the Safety Court kept the fines within limits.

The following are the rules as set forth by the Rules Committee of Mines Nos. 1 and 3. They show incidentally the provisions that have been made by the management to increase safety.

#### Coal Loaders

- (1) Timbers shall be set where needed. Safety posts shall be set in center of working place close to face.
- (2) Working places shall be sprinkled thoroughly before commencing work and before and after every shot is fired and as often as is necessary to keep dust wetted down.
- (3) Safety blocks shall be used when loading a car.
- (4) Hose shall be disconnected and hung on peg out of the way at the end of each shift. When hose is in a place where it is in danger of being run over or damaged it must be disconnected each time it is used.
- (5) Loaders must stay out of places while shots are being fired and must not re-enter them until they have been inspected by the shot-fireman.
- (6) Loaders must carry their powder into the mines in proper containers, store it in the same, placing it in cubby holes made in the rib.
- (7) No man at any time shall work under loose coal or slate whether hanging from top or rib.

#### Shot-firemen

- (1) Neither shotfirers nor any other person at any time shall open a safety light or lamp in the mines.
- (2) Cap bags must be kept closed while going from one place to another.
- (3) No shotfirer shall carry his tamping bar on his shoulder.
- (4) Shotfirers must examine places for gas before and after shooting and must look for other dangers also.
- (5) Before shooting, shotfirers must see that each coal loader sprinkles his place in both directions as far as the hose will reach.
- (6) Shotfirer must see that all posts are set in proper places to insure miner's safety.
- (7) Before tamping any shothole, shot-



W. H. Forbes

firer must ascertain that it is not bored on the solid.

- (8) All shots must be properly tamped with clay or rock dust.
- (9) Only one shot may be fired at any one time.
- (10) Shotfirer must see, before a shot is fired, that all employees are at a safe distance.
- (11) Shotfirer, before firing, must give proper warning crying "Fire in the Hole" twice.
- (12) Shotfirers must use 100 ft. of shooting cable at all times when firing cartridges and keep out of direct line of shots.

#### Drivers

- (1) Drivers shall not ride on the front end of loaded cars but may, when conditions require it, ride on the fore end of empty cars.
- (2) Drivers must lead horses from stable to manways and when crossing haulways or traveling same.
- (3) Drivers shall at all times stay with their horses.
- (4) Drivers shall not throw switches or latches without the use of the throw where throws are provided.
- (5) Drivers must accompany each car to and from the working place.
- (6) Drivers, snappers or motormen must report bad track or switches to foreman immediately.

#### Trackmen and Timbermen

- (1) Trackmen shall not leave track or switches in a dangerous condition nor shall timbermen leave working places till they have been made safe.

#### Post Injuries Each Month

FEDERAL MINE No. ....					
THIS IS NO-ACCIDENT MONTH!					
WATCH YOUR STEP					
Number of Accidents	Name of Person Injured	Number of Accidents	Name of Person Injured	Number of Accidents	Name of Person Injured
1		11		21	
2		12		22	
10		20		30	

NEW ENGLAND FUEL AND TRANSPORTATION CO.

#### Motormen and Snappers

- (1) All lights must be turned on while locomotive is in motion.
- (2) Trolley pole must be kept against trolley wire whenever locomotive is moving on butt entries or main lines.
- (3) Locomotive must never be run with trolley pole in reverse position, except where pole cannot be turned.
- (4) Brakemen, must keep their socks pulled up over their trouser legs.
- (5) Motormen must not jump from the locomotive or trip to throw a switch while the locomotive is in motion.
- (6) When retracking a car, brakemen and motormen must keep their hands off all moving material except the short retracking jumpers.
- (7) Red lights must be used on the rear end of all trips hauled by locomotives.
- (8) Only brakemen may ride on the rear end of trips.
- (9) No more than two men may ride on the top of any locomotive and then only by permission from general mine foreman.
- (10) Gathering motormen or brakemen must not ride on main-haulage trips except by permission from the general mine foreman.
- (11) No locomotive shall be allowed to approach nearer than 200 ft. to other locomotives, trips, machines, etc.
- (12) All motormen must report faulty switches and dangerous hanging wires.
- (13) All latches without throws must be moved by the heel of one foot. Hands must not be used.
- (14) Motormen must not reach over the end of a locomotive when in motion for the purpose of throwing switches or latches.
- (15) Motormen shall not turn trolley poles while the locomotive is in motion.
- (16) Brakemen or motormen shall not ride the front end of loaded cars.
- (17) Brakemen or motormen shall not hold latches with their hands while a locomotive or car passes over a parting.
- (18) Brakemen shall not couple or uncouple cars in motion except at the car haul on the shaft bottom, and there a hook must be used for that purpose.
- (19) Brakemen shall not hold couplers with their hands or feet while cars are being coupled.
- (20) No one shall attempt either to open sand pipes or to oil or to repair locomotives while the latter are in motion.
- (21) No motorman or brakeman shall attempt to couple or uncouple cars from the inside of a curve.
- (22) No one except a brakeman or driver shall be permitted to ride an empty car into a working place.

#### Machine Men

- (1) Machine men shall report all bad switches, loose trolley or transmission wires.
- (2) None but company officials shall be

allowed to talk around machines when they are in operation.

(3) Machines shall not be moved into any place without first examining the roof and testing for gas.

(4) Employees must stand in a safe place when machinery is passing.

(5) Jack pipes must be set solid before a machine starts to make a cut.

(6) Machine men must use the hose provided with each machine and shall always apply water to cutter bits when cutting any place.

#### Repair Shops Above or Below Ground

(1) No material such as wood, pieces of iron, etc., shall be left between main-line tracks.

(2) After cars are jacked up they shall be properly blocked before repairman proceeds to work on them.

(3) When left in shop, gasoline or kerosene shall be kept in proper containers.

(4) No motormen or drivers shall run cars onto repair tracks without signals from the car repairmen.

(5) Goggles shall be used while operating emery wheels.

#### Tipple

(1) Machines shall not be oiled except where oiler can stand on his feet and in a place where his body will be free of machinery.

(2) Only the person designated shall start and stop tipple machinery, and those so designated must remain to see that machinery is in proper motion or has stopped.

(3) No one shall stand under slate chutes or coal conveyors while tipple is in operation.

(4) When moving cars by hoist, men must remain at least 2 ft. away from rope.

(5) Mine ties shall not be used for poling cars. A pole specially supplied for that purpose shall be employed.

(6) No one shall walk along the tops of empty railroad cars.

(7) No one shall get under a jacked-up car unless it is properly blocked.

(8) Truck drivers going to tipple for coal or slate shall obey the safety rules governing tipple operation.

(9) No one shall ride trucks without special permission from superintendents or outside foreman.

(10) Truck drivers must stop before crossing railroad tracks.

#### Man Trips

(1) No one shall stand up in a man trip when it is in motion, nor shall any one sit on the trolley-wire side of a car or get on or off the car when it is in motion.

(2) All persons shall take their place in line at man-trip stations and on leaving man trip for shaft bottom.

(3) No person shall crowd or push on entering or leaving a man trip.

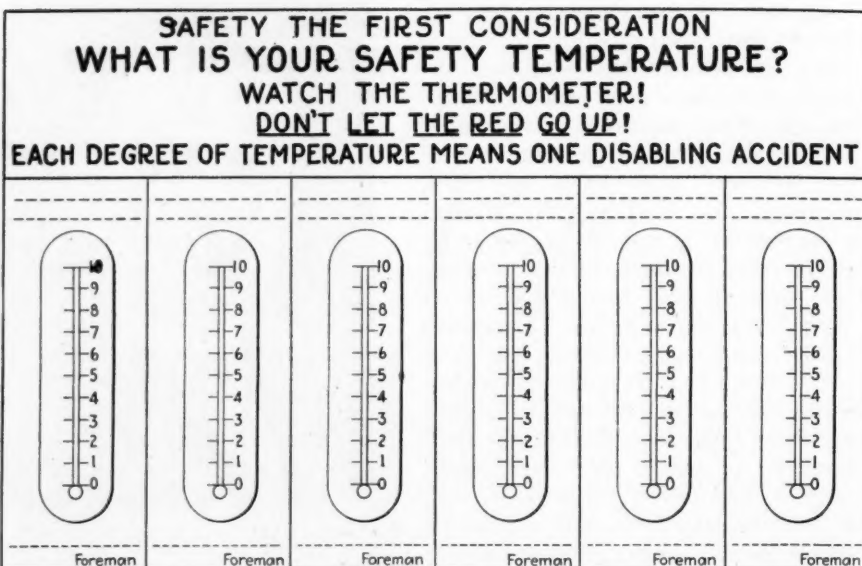
#### Miscellaneous

(1) When a brattice or curtain is accidentally torn down it must be replaced. If it cannot be replaced the boss shall be notified immediately.

(2) No bratticemen or other person shall throw down boards or any other piece of wood which has protruding nails.

(3) Any one removing timbers for any necessary purpose must replace them if conditions require it.

(4) No one shall remove lights, tamper with telephone wires or first-aid outfits or remove tools from designated places without returning them. (For an offense against this rule a fine in excess of the regular 50c. shall be assessed to be fixed by the safety court.)



#### How Foremen Compare Accident Ratings

(5) Doors must be kept closed at all times except while passage is being made through them. (For an offense against this rule the same penalty shall apply as in regard to rule 4 unless the case is otherwise handled by company officials.)

(6) Persons must stand 25 ft. away from automatic doors when a trip or a machine is passing through them.

(7) No one shall ride in empty trips entering the mines except in the first two or three cars nearest the locomotive. These men shall be subject to rules relating to those traveling in man trips.

(8) Metal tools shall not be carried on the shoulder in entries where bare electric wires are hung.

(9) Miners taking tools from the shop to mine bottom shall leave them outside the lamp house while their time cards are punched and their lamps are delivered to them.

(10) When descending the shaft, the miner must lay all tools on the bottom of the cage and must wait till all men have disembarked before picking them up.

(11) All employees must use the bridge provided for that purpose when crossing the empty track on the shaft bottom, even when no cars are on the roadway.

(12) Bottom cagers, while the cages are in motion, must stand such a distance from the shaft that no falling coal or other material can hit them. They must not take unnecessary chances in crossing between cars or between the cars and the sump.

In order to maintain interest in the safety movement all club members must attend at least one regular meeting each month and answer the roll-call or be fined 50c. unless a reasonable excuse is provided. The rules quoted have been added largely as the result of experience arising from accident and consequently do not follow in the exact order in which they are quoted. In this very irregularity they show the spontaneous manner in which they have arisen. They emanate from the discussion of the club members and are of their own devising and so have their complete

indorsement as being essential for their safety individually and collectively. At meetings of the Safety Club the various persons charged with violations are tried and required to pay fines. At these meetings entertainment is provided. The number of persons present is evidence of the interest aroused. Sometimes as many as 600 men, women and children attend.

THE so-called "No Accident Month" campaigns have been introduced. So far these have not resulted in a complete attainment of the object sought but they have, nevertheless, greatly reduced accidents and have proved themselves abundantly worth while. Two forms of record are posted, one showing the number of accidents and the names of the persons injured and the other the names of the foremen and the number of men injured during the month to date among employees under their supervision. The record of each foreman is visualized as the mercury in a thermometer, giving an opportunity to compare the records of all the foremen visually. This method of recording results is more effective because more dramatic than mere figures.

Printed or mimeographed letters are sent by Mr. Brown to every employee at short intervals urging that greater effort be made to eliminate accidents. "The skeptic and scoffer say 'Safety is the bunk,'" says Mr. Brown in one of these, "but chance taking fooled over 2,500,000 persons in industry last year—they were hurt. Don't you be fooled."

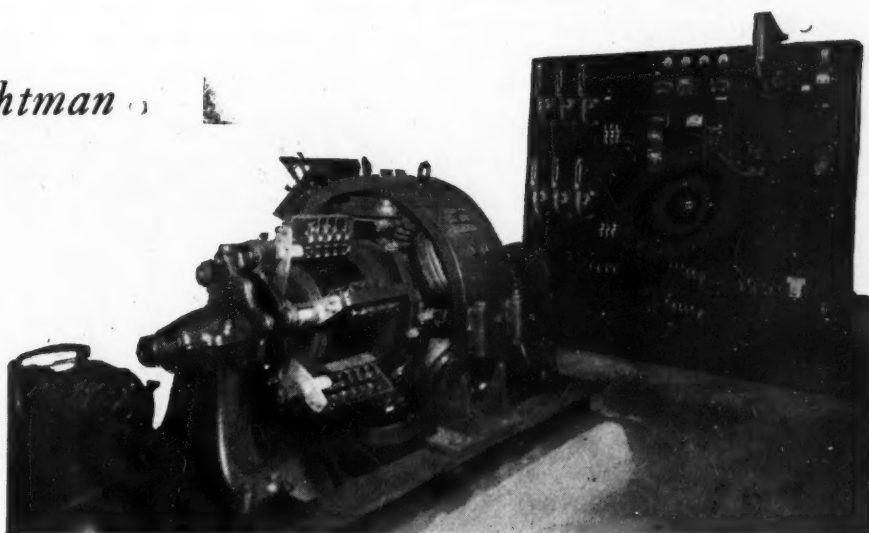
Concurrent with this fight against moral hazards goes that against physical hazards. This subject is proper material for a further article.



# *It Pays to* STUDY YOUR SUBSTATION

*By J. W. Wightman*

*General Electric Co.,  
Cincinnati, Ohio*



*Full Automatic Single-Unit Underground Substation  
In Mine at Big Stone Gap, Va.*

**S**ELECTION of the proper substation equipment warrants earnest consideration. In the day of steam-engine-driven d.c. generators selection of the generating equipment was a simple matter, as size was the principal item to consider and that not highly important, because all electrical machinery was much underrated, and therefore capable of carrying greater overloads than the engine or prime mover.

The advent of a.c. generating equipment with its inherent advantages as to transmission made the selection of power equipment more difficult, for it became necessary to decide between the motor-generator set and synchronous converter, to select the best substation location, and to determine what size would be the most economical under the particular local conditions.

**T**HE recent applications of full-automatic switching equipment to the substation unit has made it imperative to give the problem the most careful study if the best possible results are to be obtained.

A purchaser of substation equipment now has the following items to consider in his selection of equipment: (1) location; (2) size; (3) whether to use a motor-generator set or synchronous converter; (4) whether switching equipment should be hand control, semi-automatic, or full-automatic, and (5) if full-automatic, what type of control should be used.

In the case of a new development the ideal location for a substation is at the pit mouth. Unfortunately,

at many plants this location is not changed as development proceeds, the result being low voltages at the working faces. Substation locations should not be permanent, except possibly where power is being supplied to the main haulage. Even for this duty the ideal location is approximately one-half to three-quarters of a mile from the tippie and with additional substations every mile to mile and a half thereafter. It should be remembered that even with an economical amount of feeder copper, current at low voltage cannot be conducted efficiently much over a mile.

All substations except those supplying current for main haulage should be as near the center of the load as possible and should be moved periodically as the mine develops. As the work spreads out and new, remotely located areas are developed, new substations should be installed at load centers, keeping in mind the above rule. Location is very important if maximum efficiency is to be obtained from all equipment, as good voltage is necessary for maximum machine output with the lowest possible power cost. Poor voltage not only slows machine operation but power is wasted in high transmission losses. No mine operating under

present-day conditions can afford to waste anything. The placing of substations at the load centers has led to the installation of numerous underground stations.

**A**LL mining substation equipment should be nominally rated; that is, it should have capacity for developing 50 per cent overload for two hours and 100 per cent overload momentarily. This rating should apply to the transformers and switching equipment as well as to the generating unit itself. This high capacity for overload is necessary in order to take care of high peaks, which regularly occur with mine loads. The unit also should be highly efficient at loads much below normal, as the average mine load-factor is less than 50 per cent.

Keeping the load factor as high as possible is an important consideration when selecting the size of unit. It has been found by experience that the size most commonly selected and the one best adapted to average conditions is the 200-kw., although where the work is concentrated and operations can be regulated the 150-kw. size can be used advantageously, thereby obtaining an exceptionally good load factor. At heavy load

centers it is sometimes advantageous to go to the 300-kw. size, which can be obtained either by two 150-kw. units or one 300-kw. unit. Such cases, however, are rare. Most conditions favor the 200-kw. unit.

Each set of conditions deserves special consideration, and it is important to give such consideration under present-day competitive conditions. Don't buy a 200-kw. unit because Tom Jones, a neighboring operator, purchased one, as such a unit may be right for his conditions and entirely wrong for yours.

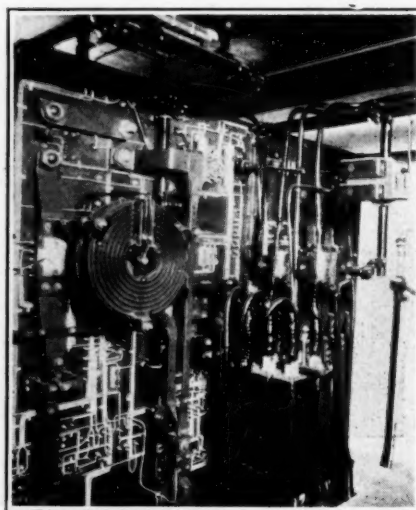
**T**HERE always has been, and probably always will be, a variance of opinion as to which is the better mining unit, the synchronous converter or synchronous motor-generator; each, however, fills its place better than the other under certain local conditions. If the a.c. load is made up of a large inductive load, as in the case of plants where large induction-type hoist motors are installed, a motor-generator set with motor capacity for power-factor correction should by all means be used. Also under conditions where a.c. supply voltage is too variable for obtaining satisfactory d.c. voltage from a converter, as often is the case when units are installed at the end of long, heavily loaded transmission lines, a motor-generator set having overcompounding should be used, because speed alone affects the d.c. voltage of a motor-generator set, and variable a.c. voltage does not affect the speed unless it drops to a point where the set goes out of step, a condition which should be corrected by the company supplying power to the unit.

**I**N ALL other cases the balance is in favor of the synchronous converter because of its capacity for high overloads, its high efficiency at all loads, and the ease with which it can be moved into narrow spaces such as mine entries, where units are installed underground. The first cost of a synchronous converter with transformers and switching equipment is somewhat less than that of a motor-generator set, but this often is offset by a higher cost of installation for the converter. In coal fields where drift mining predominates the synchronous converter also predominates; in shaft mining fields the motor-generator set has the call.

Three types of switching equipment are available for controlling substation units: manual control, semi-automatic equipment, and full-

automatic switching equipment. The vast majority of substations in use today are manually operated, as the other types are of comparatively recent development.

**T**HE semi-automatic equipment consists of manual control of the a.c. end and automatic control of the d.c. end. The d.c. equipment is of the reclosing type, which trips out on overloads and recloses when safe load conditions are re-established. Practically all new units are thus equipped



*Rear View of Switchboard in Full Automatic Substation*

and a large number of the older units have added the reclosing feeder equipment. The d.c. recloser tends toward continuous d.c. service, as the interruptions to service are of shorter duration than in the case of manual control. When the substation is located near shops or pump sites, installation of reclosers may make it practical to dispense with the regular substation attendant.

The latest development in the way of switching equipment is full-automatic control. The placing of substations at load centers means that a majority of such substations are located remotely and are isolated, and therefore must be constantly attended. Such conditions have favored the installation of full-automatic switching equipment, as there is no better attendant available, and the elimination of man power is an economic consequence.

When an attendant can be eliminated automatic switching equipment will soon pay for itself. Furthermore, no human attendant is capable of doing the job as well as the combination of sensitive relays and strong contactors. A large percentage of the underground stations and re-

motely located outside stations are thus equipped, as well as a fair proportion of the others. Up-to-date, full-automatic switching equipment is thoroughly reliable and requires little if any attention outside of inspection at regular intervals by the mine electrician. It is well to remember that full-automatic equipment of the latest design costs comparatively little more than the semi-automatic and accomplishes a great deal more. The time is not far off when practically all substations will be controlled by full-automatic switching equipment.

**T**HE most common method of control is by push-button stations conveniently located on the outside—as a rule near the tippie. This push-button station is of the “start-stop” type, while other stations, which may be located at strategic points, are of the “stop” type only. Another method of control is by using a time clock, which starts a station at a predetermined time each day and also shuts it down at a predetermined time. This time can be changed at will or the clock can be cut out entirely by a push-button station wired in multiple.

Another method used at times is load control. This is adaptable where two units in the same stations, or sometimes in different stations, take care of periodic peaks. One unit operates continually and the other is started and run only when the load reaches the point where it cannot be taken care of by one unit. This means of control saves the running-light loss of one unit when power demands are normal and also maintains better load factor with resultant improved efficiency. Both units are so wired that either can act as the leading unit, and also so that the idle unit will start automatically should trouble occurring in the other cause its shut-down. Most users fail to recognize the advantage of such control, but its resultant economy is well worth thorough consideration.

Other methods of control have been used but are more or less rare. One user is now controlling his automatic substations by a dial number on his automatic telephone, in which case the receiver in the substation is left off the hook, so that the man who starts the station can listen in and hear this station come up to speed and the d.c. contactor go on the line. Such a control is interesting due to its novelty but conditions seldom warrant the application.



# Why Did Coal Mines Lose a Billion Dollars In Five Years?

By George C. Williams

Formerly Assistant Chief, Special Assessment Section, Natural Resources Division,  
Bureau of Internal Revenue

WHY is it that an average of two out of every three coal-mining corporations reported losses during the years 1921-1925, inclusive? What caused coal-mining corporations, taken as a whole, to report a net loss of \$27,994,942 for the year 1925? These and other interesting facts are shown in Table I.

According to capital-stock tax returns filed as of July 1, 1925, the aggregate fair value of the capital stock of 3,793 coal-mining corporations was approximately \$2,000,000,000.<sup>1</sup> A reasonable return on this \$2,000,000,000 would be at least 12 per cent each year. Accordingly,

on their investments. Table II contains available statistics as to the market price of stocks and dividend payments which, if anything, picture actual conditions in a favorable light as the corporations listed are comparatively large ones whose losses have been less severe than those of smaller coal-mining corporations.

During the years 1921-1925, inclusive, the market value of coal-mining corporation stocks depreciated in most instances over 50 per cent and very few dividends were paid. It is interesting to note that the market value of stocks of large public utility, railroad and other corporations,

shown by the following data taken from published financial statements:

Consolidation Coal Co.	Tonnage	Gross Income	Net Income
1920.....	9,189,281	\$38,848,945	\$8,409,724
1925.....	10,794,903	20,778,042	460,655

Pennsylvania Coal & Coke Corporation	Tonnage	Gross Income	Net Income
1920.....	2,968,479	11,181,594	1,668,329
1925.....	2,519,598	5,652,012	-467,532

The transportation, public utilities and manufacturing industries consume 84 per cent of the bituminous output. The 1925 net earnings of the manufacturing industry increased almost 50 per cent over the 1920 net earnings, while the transportation and public utility earnings in 1925 showed about 100 per cent increase over 1920 earnings. Net earnings of coal mining corporations in 1925 were over 100 per cent less than in 1920, as shown in Table IV.

The price depression and large losses suffered by coal mining corporations and their stockholders can be ascribed primarily to (1) overdevelopment, and (2) too many small corporations.

War conditions creating an abnormal demand which induced operators to develop acreage and increase plant and equipment to a capacity far in excess of average normal expectations; strikes and irregular demand are the principal causes of overdevelopment in the bituminous coal mining industry. As a result of this overdeveloped condition the bituminous coal industry has (1) large amounts of capital unproductively employed; (2) wasteful and destructive competition because the supply greatly exceeds the demand, and (3) unsettled labor conditions caused by part-time employment.

Too many small corporations operating as independent units have resulted in wasteful production, administrative and distribution methods. A few of these wasteful methods that large-scale corporations could greatly reduce or eliminate entirely may be summarized as follows:

(1) Small corporations use their plant

Table I—Net Earnings of Coal Mining Corporations, 1920-1925, Inclusive

Year	Total Number of Corporations	Corporations Reporting Net Income		Corporations Reporting Deficits		Net Income Minus Deficit
		Number	Income (a)	Number	Deficit	
1920 (b).....	3,673	2,977	\$246,567,604	693	\$7,642,323	\$238,925,281
1921 (c).....	3,656	1,079	67,435,343	2,577	72,521,815	-5,086,472
1922 (d).....	4,110	2,464	131,441,451	1,646	36,465,137	94,976,314
1923 (e).....	3,872	1,391	117,825,998	2,481	55,898,667	61,927,331
1924 (f).....	3,516	830	40,462,981	2,686	93,881,987	-53,419,006
1925 (g).....	3,767	1,102	42,951,193	2,665	70,946,135	-27,994,942
Totals (5 years).....	18,921	6,866	\$400,116,966	12,055	\$329,713,741	\$70,403,225
Averages (5 years).....	3,784	1,373	\$80,023,393	2,411	\$65,942,748	\$14,080,645

(a) Federal taxes have been deducted from net income. Source: "Statistics of Income" published and compiled by the Bureau of Internal Revenue, U.S. Treasury Department for (b) 1920; (c) 1921; (d) 1922 (e) 1923; (f) 1924; (g) 1925.

these coal-mining corporations should have earned during the five-year period 1921 - 1925, \$1,200,000,000. As shown in Table I, the net earnings for these five years were only \$70,403,225. In other words, these corporations fell short of earning a fair return by over one billion dollars during the above period.

Stockholders in bituminous coal mining corporations naturally also have been affected by these inadequate returns. The stockholders' losses are due (1) to shrinkage in the market value of the stocks of coal-mining corporations, and (2) to not receiving any income or dividends

which consume most of the bituminous coal produced, increased during the same period in many instances over 100 per cent and in addition regularly paid dividends.

The average value per ton of bituminous coal to the operator declined from \$3.75 per ton in 1920 to \$2.04 in 1925. It is largely due to this drop that the entire coal industry, as shown in Table I, showed a change from a net profit of \$238,925,281 in 1920 to a net loss \$27,994,942 in 1925. A summary of the 1920-1925, inclusive, bituminous coal tonnage, total value, and average value per ton is given in Table III.

The effect of the drop in the price received for bituminous coal from approximately \$3.75 per ton in 1920 to \$2.04 per ton in 1925 is specifically

(1) The fair value of the capital stock for capital stock tax purposes is the estimated value of the entire outstanding stock of the corporation considered as a going concern. Source: "Statistics of Income, 1925," Pages 44 and 67.

Table II—Market Prices and Dividend Payments, Bituminous Coal Mining Corporations, 1921-1925

	1921		1925	
	High	Low	High	Low
Pennsylvania Coal & Coke Corporation.....	35½	31½	26½	12½
No dividends since November, 1924				
Consolidated Coal Co. of St. Louis.....	84	70	52½	52½
No dividends since June, 1923.				
Central Coal & Coke Co.....	92	92	71	59
No dividends since January, 1924.				
Elk Horn Coal Corporation.....	25½	16	15	7½
No dividends since September, 1919.				
The New River Co.....	57	40	31	25
No dividends on common stock; preferred dividends unpaid for several years.				
Pittsburgh Coal Co.....	68½	52	54½	37½
No dividends since October, 1924.				
Consolidation Coal Co.....	84½	84½	72	36
No dividends since January, 1925.				
Kanawha & Hocking Coal & Coke Co.....	16	Bid	2½	Bid

and equipment only a small fraction of its useful maximum capacity.

(2) Small corporations of necessity continue to employ obsolete and inefficient mining methods.

(3) Small corporations cannot afford to purchase most expensive but most efficient plant and equipment.

(4) Small corporations have higher mining costs because their mines are operated and their miners are employed only a small part of the time. The U. S. Coal Commission found that a three-day week compared with a six-day week operation resulted in a 25 per cent increase in the cost of coal mined.

(5) Small corporations buying in small quantities pay more for their supplies, plant and equipment. There is no doubt that a large corporation with its larger purchases gets more value for its money.

(6) Small corporations are unable to make use of possible byproducts. Some possible byproducts of coal are gasoline by new German process, coal-tar dyes, etc.

(7) A large portion of the present overdeveloped condition in the bituminous coal industry can be traced to too many small corporations.

(8) The administration and overhead expenses are excessive in small concerns. Ten small corporations can be more economically administered as one large corporation.

(9) Small concerns cannot afford to employ the best technical skill, executives, etc., with the result that many unnecessary mining losses and expenses are incurred due to inefficient administration.

(10) The selling costs of small concerns are excessive and can be reduced by mergers or consolidations into larger corporations. A large-scale coal-mining corporation would have its own selling organization and the number of salesmen and selling costs would be materially reduced. A large coal-mining corporation also could sell more coal direct to the consumer. Large petroleum corporations have eliminated wholesale distributors.

Table III—Tons Produced and Value of Bituminous Coal, 1920-1925

Year	Tons	Total Value	Av. Value per Ton
1920.....	568,667,000	\$2,129,933,000	\$3.75
1921.....	415,922,000	1,199,984,000	2.89
1922.....	422,268,000	1,274,820,000	3.02
1923.....	564,565,000	1,514,621,000	2.68
1924.....	483,687,000	1,062,626,000	2.20
1925.....	520,053,000	1,060,402,000	2.04

Source: Statistical Abstract of the United States, 1926.

Table IV—Comparison of Net Earnings of Coal Producers and Large Consumers in 1920 and 1925

Industry	Net Earnings	
	1920	1925
Manufacturing.....	\$2,337,317,296	\$3,154,361,686
Transportation and public utilities.....	580,002,614	1,147,634,405
Coal mining.....	238,925,281	—27,994,942

Source: "Statistics of Income, 1920 and 1925."

(11) Too many small corporations cause wasteful competition. A large-scale corporation composed of 100 small corporations would have one salesman call on a consumer, whereas the 100 small concerns have about 100 salesmen calling on the same consumer, each trying to outbid the other.

Let us assume for purposes of illustration that 25 of the largest existing coal-mining corporation in Ohio are merged into one large corporation. At the date of the merger it undoubtedly would be found that the new large-scale corporation can, among other things:

(1) Produce the same amount of coal with about 50 per cent of the developed coal lands, plant and equipment.

(2) By buying in large quantities greatly reduce the costs of its purchases. It is much cheaper for a manufacturer to sell to one corporation than to 25.

(3) Increase the operating time of its mines by cutting down the number of mines, etc.

(4) Decrease its cost by the introduction of costly but efficient plant and equipment.

(5) Do away with obsolete mining methods.

(6) Reduce freight costs by having each mine serve its natural markets.

(7) Restrict the development of new coal lands to meet estimated demand.

(8) Reduce the number of administration and selling officers and employees.

(9) Concentrate the offices into one or two offices, reducing rentals, etc.

(10) Reduce costs of selling coal.

(11) Get more for its coal by doing away to some extent with wasteful competition.

(12) Make favorable long-term contracts by reason of large coal reserves and financial ability.

(13) Employ best technical experts and executives to improve production, administration and selling methods.

(14) Enter into voluntary agreements as to natural division of territory with other large coal operators and make export agreements under Webb-Pomerene Export Act.

(15) Get proper freight-rate protection. Public utility corporations are protected by franchises. Manufacturers are protected against foreign cheap labor by tariff provisions. There exists no reason why the natural coal markets of states having high-priced labor should not be protected against states having the advantage of cheap labor. Such protection can to some extent be obtained by high freight rates on coal shipped outside of natural markets.

Tax statistics<sup>1</sup> for 1925 indicate that 87 per cent of the total income

(1) Source: "Statistics of Income, 1925."

reported by 430,072 corporations was earned by 4,469 large corporations reporting net incomes of over \$250,000. The present-day trend is toward larger corporations. The large railroad, public utility, manufacturing and trading corporations—e.g., Pennsylvania R.R., Standard Gas & Electric Co., General Motors Corporation, Woolworth and the National City Bank—are excellent illustrations of the advantages of large-scale over small-scale business.

It is impossible for small coal-mining corporations to sell profitably to the large-scale well-organized railroad, public utility or manufacturing corporations because of wasteful, unprofitable competition. Likewise it is impossible for a small coal-mining corporation to compete profitably with a large-scale coal-mining corporation which gets the benefits of many economies of production, administration and distribution.

Coal-mining corporations will have to assume upward of another billion dollar "loss" during the five years 1926-1930 unless (1) immediate steps are taken toward eliminating the existing overdeveloped condition, and (2) existing coal-mining corporations merge or consolidate into large-scale corporations that will be able to compete profitably with other large-scale corporations engaged in their own or other industries.

**OVERDEVELOPMENT** can and must be eliminated by the coal-mining industry. It is impossible for the coal industry to operate profitably with so much capital unproductively employed in overdeveloped coal lands and excess mining facilities. Coal-mining corporations that expect to survive and operate profitably in the future must cut down their abnormal productive capacity to a reasonable normal level. Increased friendly relations and co-operation are necessary between the various coal-mining corporations. Coal operators also should take more interest in the various coal associations to which they belong and through these associations endeavor to reduce overdevelopment.

Comparatively speaking fewer mergers and consolidations have taken place in the coal-mining industry than any other industry. Consolidation and merger of coal mining corporations will go a long way toward changing the one billion dollar loss into a billion dollar profit and toward solving other serious problems of the coal industry.



## Cambria County Stages

# MINING EXPOSITION

## And First-Aid Meet

**T**HROUGH the inspiration of Charles M. Schwab, moving spirit of the Cambria County Industrial Exposition, thousands of people were attracted to Ebensburg, Pa., July 2-7, 1928. Of special interest to coal-mining men were exhibits of equipment shown by 45 manufacturers and jobbers serving the coal industry, daily coal-dust explosions managed by the U. S. Bureau of Mines, the annual outing and golf tournament of the Central Pennsylvania Coal Operators' Association on Friday, July 6, and the contest for the first-aid championship of Pennsylvania on Saturday, July 7.

Following an afternoon of golf, two hundred coal operators met for dinner in the pavilion, where prizes were awarded for various degrees of proficiency.

B. F. Clark, president of the Central Pennsylvania Coal Producers' Association, presiding as toastmaster during the annual dinner, introduced Harry L. Gandy, executive secretary of the National Coal Association; Justice John M. Kephart, of the Supreme Court of Pennsylvania; Judge McCann, of Ebensburg, Pa.; Judge Chase, of Clearfield, Pa.; Charles M. Schwab and Charles O'Neill, secretary of the Central Pennsylvania Coal Producers' Association. Referring to the exhibits of mining equipment he had viewed during the day on the exposition ground, Mr. Gandy drew a picture of the place modern machinery has made for itself in industry

and reminded his hearers of the changes such developments brought in the field of managerial technique. He referred to Mr. Schwab, guest of the evening, as a great human engineer.

Addressing himself to the larger problems of organization, Mr. Schwab advised coal operators to forget petty differences and pool their interests. Where the present Sherman anti-trust laws prevent intelligent co-ordinated action, he advised that a drive be made to effect such changes in the law as will permit operators and the consuming public to derive the full benefit of efficient operation, as is being done through cartels in Germany.

Reminding them that central Pennsylvania had suffered over a period of years from adverse freight rates, Mr. O'Neill asked the members of the association to be prepared to support measures looking toward early relief. "Pittsburgh operators fought their fight alone," said Mr. O'Neill, "and without the assistance even of those in a position to benefit quite as much as themselves from any reduction in rates. Even in our own case we have gone on without support from the bulk of the tonnage. Ours has been only a partial victory. Operators to the west of us have as much at stake as ourselves. They should be vitally interested."

Continuing, he said: "Operators

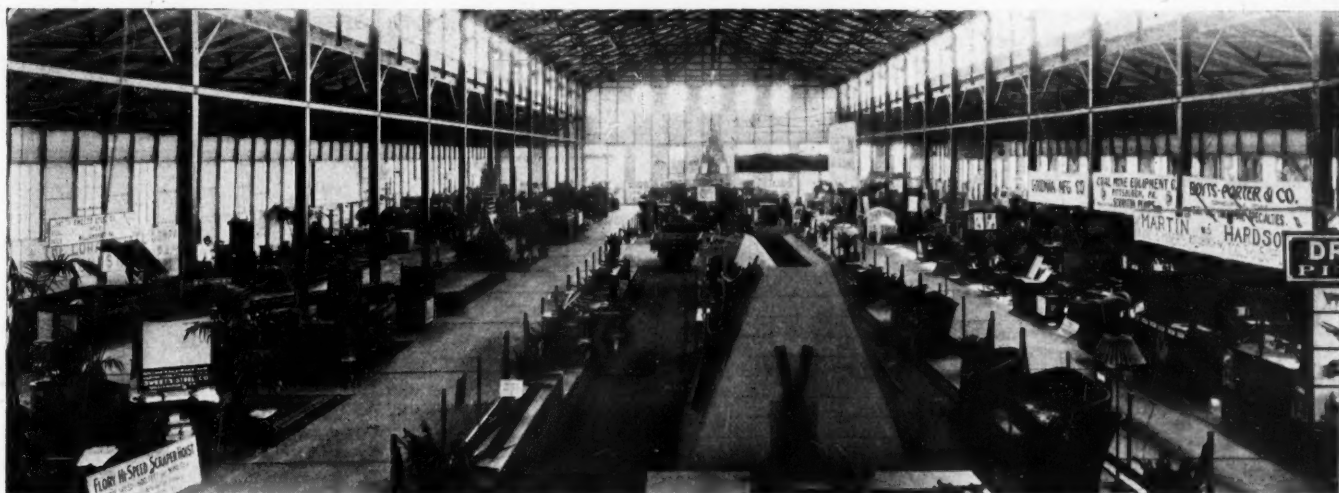
*Looking Through Industrial Hall*

have no desire to deprive carriers of revenue, but it is economically unsound to sell coal at a loss while the railroads make a profit on every ton handled. The carriers themselves are beginning to realize that this basic product must be given more consideration, evidenced by the fact that they have more respect for those who fight for their rights than for those who do not."

Speaking of consolidations, Mr. O'Neill said engineers and auditors representing several central Pennsylvania companies and drawn from their own personnel had been working since January 1 in order to find a sound basis for further consolidation. While no definite decision has been reached, much of value has already resulted from the inquiry.

Nothing attracted quite as much attention as the coal-dust explosions set off three times each day under the direction of the U. S. Bureau of Mines, in charge of H. C. Haworth, superintendent of the experimental mine at Bruceton, and A. A. Munsch, director of the Bureau of Mines exhibits in the Pittsburgh district. During the latter days of the exposition, when coal men in large numbers were present, an opportunity was given to compare the effects of pure coal-dust explosions with a 65 per cent mixture of rock dust.

The degree to which flame was smothered by the rock-dust mixture was emphasized by the directors and easily noted by the spectators who, standing 100 ft. away, scarcely saw a flame and felt no heat, whereas during the explosion of pure coal dust the flames shot 40 ft. in the air and were sufficiently intense to make it uncomfortable for spectators. That these demonstrations were appreciated was evidenced not only by the large crowd that attended each explo-





sion but also by the questions asked of those in charge and the eagerness with which coal mining men examined the gallery after each shot was fired.

The first-aid championship contest, won by No. 1 team representing Monroe Coal Mining Co., Revloc, Pa., attracted 28 teams representing 25 companies. Five problems were worked and the winning team achieved a perfect score. The Schwab trophy was presented to Captain Adams by Mrs. Charles M. Schwab. Following the meet addresses were made by Mr. Schwab and Walter H. Glasgow, Secretary of Mines, State of Pennsylvania.

"How many lives might have been saved in industry thirty years ago," said Mr. Schwab, "had there been men trained as you men are trained? Through the kind of co-operation you are engaged in great good is being accomplished. Keep it up. As industry becomes more humane and more considerate of human life it becomes more enjoyable and more profitable."

In a brief address Mr. Glasgow expressed his appreciation to the men who participated, but said he was far from satisfied with the number of teams that tried for the trophy. With thousands of men employed by hundreds of coal companies in Pennsylvania alone, he felt that every man should be trained in first-aid, because first-aid men not only are more careful workers but tend to reduce accidents among fellow workers.

"If the best fruits of genuine co-operation between operators and state mine officials are to be achieved," said Mr. Glasgow, "let every operator in the state determine now to be represented by a team next year." The arrangements for the first-aid contest were made by H. D. Mason, Jr., secretary of the Coal Mining Institute of America. Judges were selected from among state mine inspectors, Bureau

#### *Demonstrating Coal-Dust Explosion*

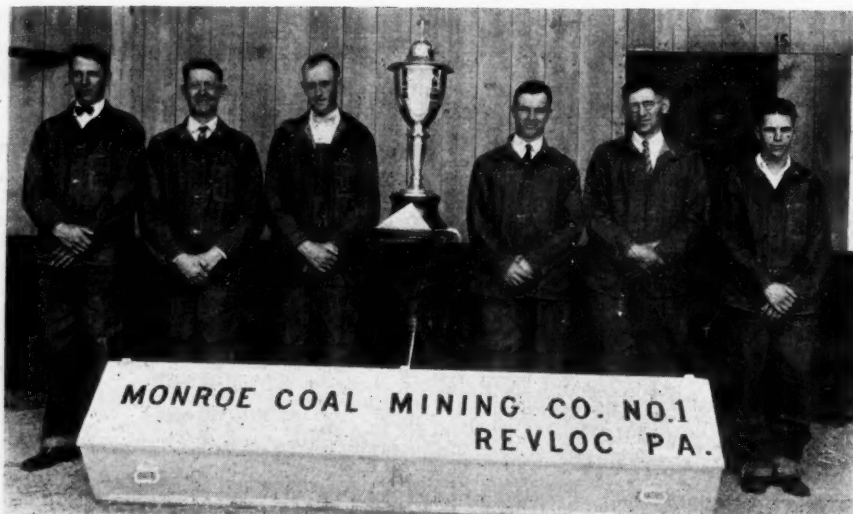
of Mines men, coal company officials and representatives of equipment manufacturers.

Approximately one-half the space taken by industrial exhibitors interested in coal mining was taken by the Bethlehem Steel Corporation, which occupied the middle portion of the main exhibition hall. Steel mine cars, switches, turnouts and steel mine ties were on display. A new CR-1 room and pillar low vein coal cutter 12 in. high, equipped with rope feed or chain feed, was shown by the Sullivan Machinery Co., which also showed in operation a low-vein air compressor. Pumps—centrifugal, reciprocating, bronze, all-chrome, wood and lead lined—were shown by Dravo-Doyle Co., Weiman Pump & Supply Co., Harris Pump & Supply Co., James T. Castle, Crawford Machinery Company, Coal Mine Equipment Co., and Boyts-Porter Co.

The Martin Hardsocg Co. had on display miners' tools and supplies,

#### *Winners of Schwab Trophy*

Left to right—James Adams (captain), James Brown, Robert Horn, Jack Harvil, Bert Reese and the patient.



among them a flexible bug-dust scraper. Line materials and rail bonds were exhibited by the Ohio Brass Co., Mosebach Electric & Supply Co., Flood City Brass & Electric Co., Penn Machine Co. and Pennsylvania Electric Repair Co. The General Electric Co. combined with its line material display a demonstration of household equipment and a power-factor control system.

An opportunity was given to study loaders and conveyors by the Lorain Steel Co., South Fork Foundry & Machine Co. and Gellatley Co., Inc. The latter exhibited a new mat face conveyor in which a woven mesh wire is used instead of chain or rubber belt for conveying. Rock-dust machines were shown by the Mine Safety Appliances Co. and American Mine Door Co. In addition to its "Brownie" loader, Brown-Fayro had on exhibit portable electric room hoists and Broderick & Bascom yellow strand rope. Flexible coupling made by the Victaulic Co. of America was shown by the Joiner Iron Works, Inc. The National Carbide Sales Corporation was represented by a carbide display.

In a separate building explosives were exhibited by E. I. du Pont de Nemours Co., Hercules Powder Co. and the Grasselli Co. The Atlantic Refining Co. demonstrated the effectiveness of various oils and greases, as did also the Joseph Dixon Crucible Co., which used for that purpose a motor-driven lubricant tester with bearings in oil and grease attached to spring weights and thermometers to record resistance and heating.

The Jeffrey Manufacturing Co. and the Goodman Manufacturing Co. confined their exhibits to approved controllers, headlights and locomotive parts. The Electro-Nite Carbon Co.

(Turn to page 433)



# Consolidation's New Program

## Wins General Approval

### Of Bituminous Coal Operators

**G**ENERAL approval of the policy of the Consolidation Coal Co. in closing down for an indefinite period a number of its mines as a necessary step in the stabilization of the bituminous coal industry marks the reaction of executives of other companies operating several properties. Many, however, doubt whether voluntary shutdowns will be sufficiently widespread to effect a real cure to a deplorable situation.

"Any intelligent coal operator is bound to look favorably upon the policy announced by President Anderson of the Consolidation," declares W. P. Tams, Jr., president, Gulf Smokeless Coal Co. "Many people have already publicly and privately indorsed his policy. Of the many who have done so, hardly any have themselves carried out that policy—nor will they do so."

"Our company for two years has practiced this policy and restricted its output an average of 25 per cent, as can be verified by production figures. If other people would practice this policy instead of merely indorsing it, something might be accomplished."

That the policy is constructive and sound is also the belief of Rembrandt Peale, president, Peale, Peacock & Kerr, Inc. "It should receive the approval and inspire the co-operation of the industry."

"I think the policy is absolutely right," is the statement of Otis Mouser, president, Stonega Coke & Coal Co. "In fact, it has been the policy of our company for the past fifteen years to reduce operations by closing down mines to the point where our orders in hand will take care of the output and under no circumstances to produce tonnage in excess of our requirements."

**T**HE fact, mentioned by Mr. Mouser, that his company for several years has followed the policy now enunciated by the president of the Consolidation Coal Co. is emphasized by many executives in the com-

ments received by *Coal Age* in its canvass of the situation. "We acted upon this theory in 1923," says W. H. Coolidge, chairman of the board of the Island Creek Coal Co., "so that we were apparently five years ahead of the procession. We believe now that the mines which we are operating through consolidation and otherwise are at least as efficiently handled as any mines anywhere."

The sympathy of the C. C. B. Smokeless Coal Co. with the Consolidation policy, according to P. M. Snyder, president, is best evidenced by the fact that one out of seven operations has been down for the past year. "I feel sure it is more economical to close down mines that are not needed and operate the others, say five days a week."

With four out of eight mines closed since last September, the Empire Coal Mining Co., in the opinion of A. M. Stevens, sales manager, has given convincing proof of its agreement with the Consolidation program. "It has been our policy not to force on the market coal at unprofitable prices and we have adhered strictly to this policy since the time named. We believe that if all large operating companies would endeavor to bring themselves in line with this policy, it would in a great measure eliminate the present plight of the industry."

**T**HE necessity for general support of the program is voiced also by A. L. Allais, president, Columbus Mining Co. "It is a step forward in pulling the coal industry out of chaos. If all producers would pursue that policy, the remedy we are now seeking would not be far from our reach. The remedy for the evil is in the hand of the coal producer; he is his own doctor, and the medicine is stored in his own warehouse."

W. A. Brewerton, president of the Brewerton Coal Co., is another who believes in the soundness of the plan, but fears unenlightened selfishness will block general action.

His own company, he states, is operating only two out of eleven mines. "We could operate more, but we would be contributing to the delinquency of the market, which, so far as we are concerned, we do not wish to do."

The DeBardeleben Coal Corporation, says Henry T. DeBardeleben, president, has been following the program for more than a year because it believes it offers the only immediate relief for the coal market. Recently the company has made further retrenchments. Stabilization will be helped if operators will leave unsold coal in the ground.

"Demurrage coal is one of the most harmful things in the market. If this were eliminated it would go a long way toward stabilization. In my judgment the railroads can prevent the accumulation of 'no bills' at the mines, but the coal company is the only one that can prevent the movement of consigned or unsold coal."

James B. Pauley, chairman of the board, Miami Coal Co., while indorsing the Anderson announcement, doubts whether "self-interest will permit a sufficient number of companies to follow this principle to really correct the situation. I am afraid that the surplus tonnage will have to be choked out rather than to anticipate any constructive program that would 'ease' it out."

The Pittsburgh Coal Co. in 1925 adopted a program "even more comprehensive, it seems to me," states C. E. Lesher, executive vice-president of that organization, "than that declared by the Consolidation Coal Co. in that in addition to 'the retention of the most economic mines and the present elimination of the least efficient' this company adopted a program of making its most economic mines even more economical and modern with respect to the use of machinery and human labor. That policy, adopted in 1925, has been consistently followed, not only with respect to greater and more efficient use

of machinery but with better relations with its employees. The Pittsburgh policy is, in plain language, individual efficiency."

As evidence of the willingness of his company to co-operate, J. W. Galloway, president, Maryland Coal Co., of West Virginia, points out that it closed down its No. 1 mine early in June "and will keep it shut down until the market and general business conditions justify reopening it." Mr. Galloway expresses himself as unalterably opposed to further reductions in mine wages "for the purpose of meeting ruinous competition and I am also opposed to the selling of coal below the cost of production. The sooner the industry as a whole faces the situation and meets it fearlessly, regardless of sacrifices which it may be called upon to make, just as soon will our problems be solved."

The undesirability of further reductions in the general level of wages also is pointed out by J. W. Searles, president, Pennsylvania Coal & Coke Co. "On the other hand," he adds, "the policy of most coal operators is influenced by the actions of their neighbors and competitors."

"The industry will be benefited to the extent that those operators who during the last few years have made volume their major objective may adopt the new policy of the Consolidation, but I am of the opinion that miners who are discharged should be counseled to enter other fields of endeavor, not to seek employment in other mines."

**T**HAT his company has not been backward in adopting the policies thus indorsed, Mr. Searles proves by reference to the annual reports of the Pennsylvania corporation for 1924 and 1925. "We have continued this policy of concentration to the present time. We now have 13 mines in operation with 23 on the inactive list, some of which to all intents and purposes have been abandoned permanently. Our policy is to give as good working time as possible to a minimum number of employees but not to force coal on an unwilling market at unprofitable prices."

Elimination of sufficient excess capacity to bring production in line with consumption offers the only hope of permanent relief, in the opinion of William J. Clothier, president, Boone County Coal Corporation. "Only those mines will be shut down which are forced to do so because their owners believe they cannot be

made profitable. This is the survival of the fittest. The sooner those in the industry realize it and those operations are closed which must eventually be the ones to suspend, the better it will be" for the surviving operators, the miners and the public.

The policy of the Consolidated Coal Co. of St. Louis, states W. J. Jenkins, president, "is to operate only the lowest cost properties. In marketing our product we have endeavored to secure 'cost' since 1924. We have not succeeded in doing so at any time since the adoption of the Jacksonville scale. The effect of supply and demand cannot be lightly set aside nor can non-competitive wage agreements stand against more equitable operating conditions."

Let John D. Rockefeller, Jr., and other very rich men like him who are in the coal business buy control and stabilize the industry, is the suggestion of John Lochrie, president of the Lochrie Coal Co. No temporary shut-down or shifting of personnel, he thinks, will relieve the situation. "There is nothing new" in the Consolidation plan, is the comment of S. Pemberton Hutchinson, president, Westmoreland Coal Co.

**I**F THE Anderson plan were conscientiously followed by operators in general, it "would go a long way to assist in the relief of the present deplorable situation in which we find ourselves," remarks David E. Williams, Jr., secretary, Cymbria Coal Co. "It always has been our policy to either ship coal at prices that would permit of a profit or leave the coal in the ground for future mining."

"We are holding out for a reasonable market price even at the expense of working our mines part time," states H. W. Showalter, president, Continental Coal Co. "We have definitely closed down two mines in the Ohio No. 8 field," reports William Taylor, vice-president, North American Coal Corporation.

"Our company is heartily in favor of the program from an economic point of view and as a general policy," says Whitney Warner, W. H. Warner & Co. "For the past two years we have been following this policy and now have in operation only our efficient mines. During this time we have closed down and abandoned five out of twenty-two mines. Within a very short time all the inefficient mines will be forced to close down automatically, probably never to reopen."

That the policy is thoroughly sound is also the judgment of Joseph D. Zook, vice-president and general manager, O'Gara Coal Co. For the past two years, he adds, it has been the program of the O'Gara company to operate only such mines as were essential to take care of regular business, and at the present time seven out of eight mines of the company are down.

The Southern Coal, Coke & Mining Co. is operating one of its five mines at the present time. "We cannot sell more coal at a profit," is the frank comment of W. K. Kavanaugh, president, and "there certainly is no sense in dumping additional tonnage on a saturated market."

**T**HE plan announced last May by the Consolidation company has been followed for four years by the Sheridan-Wyoming Coal Co., which closed down three out of six mines. The results of this concentration, says H. N. Taylor, president, have been more regular employment to the men kept on the rolls and cheaper cost of production. "I feel that if this policy was pursued in every mining district in this country by the principal producing companies it would be beneficial to the industry as a whole."

Restriction of production is the only cure, asserts H. S. Hopka, vice-president, Sheridan Coal Co. "We are doing our part by closing unnecessary mines. There should be stabilization of wages as well as production and a change in working conditions in the union fields."

Mechanization, particularly in the Rocky Mountain region, is receiving increasing attention from operators interested in a stabilization program. The three mines now operated by the Sheridan-Wyoming company are completely mechanized, with resultant further reductions in production costs. The Sheridan Coal Co. is working on mechanization in Montana and plans to extend this campaign to its Wyoming property.

There is nothing new in the Consolidation policy or in the feast-or-famine condition of the coal market, says C. F. Richardson, president, West Kentucky Coal Co. These conditions probably will continue "unless the larger producers in the various fields work out some plan of consolidation whereby the production of coal can be controlled in proportion to consumption and then a reasonable margin of profit can be expected on the coal produced and sold."



# Wilmington Strip Mine to Use SCIENTIFIC SELLING In Marketing Product

**S**ELLING an old coal to a new generation of consumers hardly conscious of its existence is the task which confronts the sales department of the Northern Illinois Coal Corporation in merchandising the output from its new stripping plant in the Wilmington sector of the Prairie State. That, more than a residuum of fading prejudice against strip-pit fuel, is felt to be the big sales problem which must be met if the company is to find a profitable and steady outlet for a capacity output of 1,000,000 tons per annum on a three-shift day—the ultimate goal of the operation described in the May issue of *Coal Age* (Vol. 33, p. 278).

To an older generation "northern Illinois" and "Wilmington Third Vein" were familiar names. At one time the product of the northern tier of coal-producing counties in Illinois dominated the all-rail markets of Chicago and the Northwest. But tonnage control shifted first to the thicker seams of the central part of the state and then to the newer developments in the southern counties.

As late as 1901 seven northern counties were producing 5,540,000 tons out of a total state output of 26,235,000 tons. Twenty-five years later the production of these same counties had dropped to 1,632,000 tons while the output for the state as a whole had risen to 69,800,000 tons. In other words, the percentage contribution of the northern Illinois field had declined from 20.8 to 2.3 of the total production in the state.

**I**N 1926 the commercial market outside of the state had disappeared. Commercial shipments that year were only 343,365 tons. Of this quantity the Chicago switching district took 120,997 tons, Illinois points outside of that district, 207,581 tons. The Minnesota market had shrunk to 2,167 tons, with the Twin Cities taking only 885 tons. Wisconsin commercial buying had declined to 4,134 tons and Iowa purchased 6,511 tons.

In its campaign to recover part of the lost markets for northern Illinois coal, the company working the Wilmington plant starts out with two decided advantages:

(1) A production cost far below that possible under the expensive longwall operations common in the field, and,

(2) Freight rate differentials 28 to 70c. per ton under central Illinois and 58c. to \$1 under southern Illinois to representative consuming areas in Illinois, Wisconsin, Iowa, Minnesota and Nebraska.

This second advantage, of course, is held also by other companies operating in the northern Illinois field. Standing alone it apparently has not been great enough to overcome the disadvantages of higher production costs in thinner coal when business is sought in a highly competitive market. It has not, for example, been great enough to check the declining sales in the Chicago area where the northern field has enjoyed a rate advantage of 40c. over central Illinois and 70c. over the southern field.

Nevertheless it is significant that this rate differential seems to have influenced sales in the fine-coal market where a few cents per ton may shift a contract. In 1926 out of a total commercial shipment of 8,337,922 tons of fine coal from Illinois mines to Illinois destinations, the Chicago district took 53.2 per cent. In the same year the Chicago district absorbed 57.3 per cent of the total northern Illinois shipments of fine coal to points within the state.

It is in the combination of the two advantages, however, that the Northern Illinois Coal Corporation probably will find its greatest help in overcoming the prejudice of tradition and the active competition of the mines in other parts of the state and in Indiana and western Kentucky. In seeking its place in the markets which once were the possession of the northern field the company plans to lean heavily upon scientific selling as exemplified by the combustion engineer. Joseph Harrington, well-known in the combustion field in the Middle West, has been engaged as a consultant service engineer and a combustion staff is being built up to follow the coal through to each new customer who needs to be taught how to burn it most efficiently.

Under the direction of Joseph E. Hitt, president, and Robert H. May, manager of sales, a campaign is in process to reawaken interest in the Wilmington fuel in important industrial plants and on the railroads. In capitalizing upon the advantages which the company believes it has in its new operation, however, it is not the intention to depreciate the value of its product in the eyes of the consumer by seeking orders at prices which will mean a sacrifice of all those advantages.

Nor will a drive be made deliberately upon markets where the man who wins the order loses. The territory contiguous to the northern Illinois field offers a potential annual market for 80,000,000 tons of bituminous coal. That tonnage, however, is worth while only to the extent that it yields a profit. This the management of the Northern Illinois Coal Corporation fully recognizes.

## Cambria County Stages Mining Exposition

(Continued from page 430)

showed carbon brushes, the H. H. Robertson Co. "R.P.M." protective metal in various forms, and the Sweet Steel Co. steel rails and steel ties. Self-dumping and crossover cages, as well as automatic locking horn and switches were exhibited by the Fort Pitt Equipment Co., and the Bertrand P. Macy Co. showed gears.

Timken Roller Bearing Co. was represented by an application of its product to mine-car wheels and ball and thrust bearings were exhibited by the Condon Bearing & Supply Co. Sealed hand fire extinguishers specially adapted to substation use were

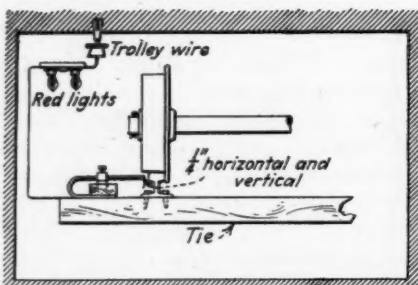
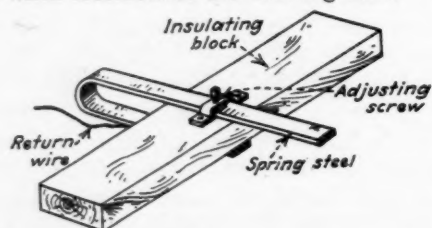
shown by the International Fire Equipment Corporation. Adjustable electric wood saws made by the D. E. Walt Products Co. were shown in operation as applied to timber framing. The Chicago Pneumatic Tool Co. had on display electric rock and coal drills. The Electric Switchman and a simple signal system demonstrated by Gellatly & Co., Inc., attracted considerable attention.

Power for driving all d.c. equipment in the exhibition hall was furnished by an automatic substation installed and exhibited in operation by the Elliott Co.

# OPERATING IDEAS from Production, Electrical and Mechanical Men

## Automatic Contact Switch Prevents Accidents

A simple arrangement of contact switch for an underground signaling system worked out by C. T. Grimm, general superintendent, Buckhannon River Coal Co., Adrian, W. Va., is shown in the accompanying illustrations. This device, according to Mr. Grimm will protect any section of a mine against mishaps of every description. Especially designed for cross-entry protection and dangerous intersections on haulways, it also affords protection for miners approaching automatic trapdoors when locomotives are drawing near.



For Safe, Quick Transportation

The switch is installed along the side of the rail a suitable distance from the intersection to be protected. The locomotive or mine-car wheels simply come in contact with the switch, connecting the return for the red light located any distance from the switch. The device is said by its sponsor to eliminate accidents and speed up transportation.

THE ARTICLE entitled "Automatic Pump Control Timed by Motor-Operated Drum," which appeared under Operating Ideas in the May issue of *Coal Age*, through an oversight failed to give credit to J. G. Stephenson, control engineering department, Westinghouse Electric & Mfg. Co., as the author. As it is customary to give this information with such material we take this method of correcting the oversight.



## Grounding of A.-C. Mining Machines Reduces Danger of Serious Shocks

"TO GROUND or not to ground" was a live topic among electrical engineers for many years after alternating current came into general use. The "Ayes" won and, as a result, the common practice is to ground the neutral or one conductor of all alternating-current circuits when the potential to ground will not exceed 150 volts. Even if the potential is as much as 300 volts, grounding is preferred. Grounding the frames of stationary motors which operate at over 150 volts is also the rule.

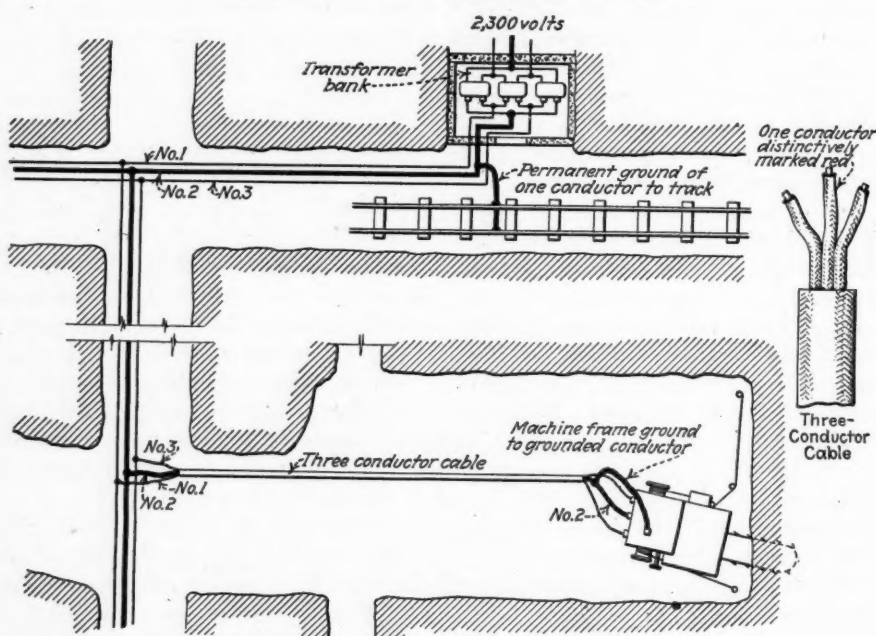
The best practice with 220-volt alternating-current mining machines is as yet not firmly established. Because the equipment is portable it is not convenient to connect the frame to ground in the same manner as is done with stationary motors. Also, because the machines are very often used in damp or wet places,

a 220-volt shock to ground is likely to be more severe than under many of the other conditions where electric motors are used.

The practice of the Union Pacific Coal Co., Wyoming, which uses a number of alternating-current mining machines, is to ground to the rails one conductor of the 220-volt three-wire circuit at the transformers, and to connect the other end of the same conductor to the mining machine frame as well as to one terminal of the motor. Except for the few volts line drop in the conductor, this keeps the mining machine frame at the same potential at the mine bottom.

Because D. C. McKeehan, electrical engineer of the company, is responsible for this standard, *Coal Age* asked him: "Just why do you think your method the safest?" He replied: "Men operating

This Method of Grounding Is Said to Be Safest



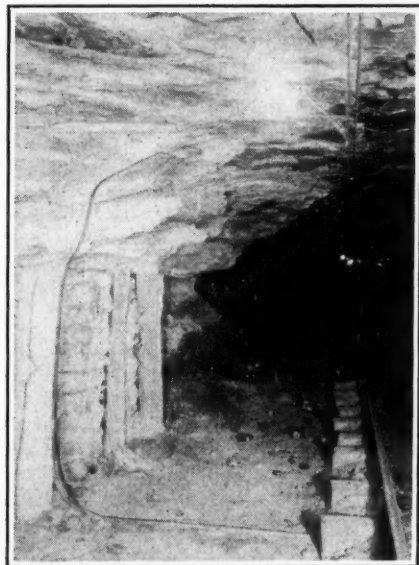


these machines are always aware that one of the conductors is hot. Consequently, they are always on the *qui vive* and are fearful that any conductor may be hot. Knowing such to be the case, they are *always* careful. I believe that my conclusions are correct for we have never had an injury reported from the operation of these machines. Another reason is that, should the 2,300-volt circuit come in contact with the 220-volt circuit, a shock to ground would undoubtedly result in a fatality in the event that the secondary was not grounded."

Mr. McKeehan's conclusions are based on careful reasoning and experience. His method practically eliminates chance of 2,300-volt shocks from cable and machine to ground, and of 220-volt shocks from machine frame to ground. The only disadvantage is perhaps a slight increase in the chance of 220-volt shock from cable to ground.

## Protected Ground Wires Make Safer Mine

Connecting each lamp in an individual circuit between trolley or feeder and the rail continues to be the popular method of lighting haulways in 250-volt mines. One trouble with the usual



Reduces Accident and Fire Hazards

arrangement is the absence of protection for the ground wire. Accidents may occur as a result of men tripping over it. Moreover, the circuit is frequently broken and, in certain mines, a slight fire hazard is introduced by this method of wiring.

The accompanying photograph shows the method of installing the lamp ground-wires in the Nellis (W. Va.) mine of the American Rolling Mill Co. Half-inch rigid conduit protects the wire along the bottom and up the side of the rib. The conduits are secured to props by the use of pipe straps.

## Static Condensers Effect Power Savings That Soon Pay for Them

WHEN Broadwell Colliery at Moosic, Pa., was opened, deliveries were slow on certain types of equipment because of the world war. This condition and the fact that the property was small influenced the selection of an induction type motor-generator set for the substation. Furthermore, in those days power generally was purchased under contracts which did not exact a penalty for low power factor. Since then, however, many of the schedules

design and installation of a suitable rotor. Either of these arrangements, of course, would better the power factor of the load but would not have the capacity for the needed amount of correction.

In view of the fact that the inductive load at the property was due in a large measure to the induction motors which had been added to the system it seemed advisable to consider some other means of correcting the power factor.

As shown by the following list of a.c. and d.c. equipment, no single unit of constant speed was of sufficient size to be changed advantageously to synchronous motor drive and thus obtain much corrective capacity:

Induction motor-generator set, one 225-hp., 3,800-volt; induction motors, one 75-hp. hoist, two 112-hp. hoists, one 20-hp. fan, one 40-hp. air compressor, one 25-hp. pump, one 20-hp. pump and two 10-hp. pumps; total horsepower of induction motors, 424.

Direct-current motor load supplied through induction type motor-generator set—One 51-hp. scraper, one 7½-hp. pump, and three 76-hp. locomotives; total horsepower of direct-current motors, 286½.

After careful consideration it was decided to obtain a static condenser unit. This decision was made because a static condenser could be obtained which would provide almost any amount of corrective capacity. Furthermore, such a unit would be low in first cost, easy to install and cheap to maintain.

The static condenser unit selected is a Westinghouse type LD, 4,000-volt 36-kva. outfit, having a maximum voltage rating of 4,400 and a maximum capacity of 43.5 kva. The power system is a three-phase 60-cycle circuit.

Owing to the fact that the condenser is built so that it requires protection from the elements it was placed inside

ADDRESSING himself to the graduating class of Rutgers College recently, H. N. Davis, retiring professor of mechanical engineering at Harvard University, said: "Memory training is of little value as compared with training in thinking. Most education comes after graduation, not before."

Hard-headed experience is what counts. Its value is multiplied when recorded.

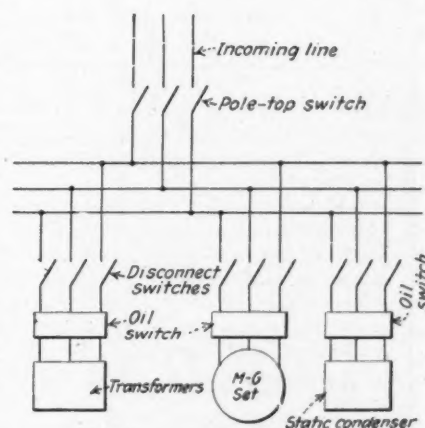
have been rewritten with the idea of charging each consumer a rate more equitable from a power factor basis.

Lagging power factor of the load at Broadwell was of no serious consequence at first because the amount of equipment drawing energy through the induction motor-generator set was small and few other induction motors were used. As the property grew additional d.c. equipment was installed and several more induction motors were put into service.

By 1924 the induction load at the property had greatly increased and under the new power schedule an unusual opportunity was presented to effect savings in power costs. The power factor of the load had become unfavorable. The inductive kilovolt-ampere-hours compared with the kilowatt-hours consumption in a given month indicated that the out-of-phase current taken from the supply lines was extremely large.

First considerations regarding the possibilities of correcting the adverse power factor conditions brought attention to the induction type motor-generator set. A synchronous motor could be obtained for the motor-generator set, or the existing induction motor could be changed to synchronous by

Fig. 1—Static Condenser Is on Main Circuit



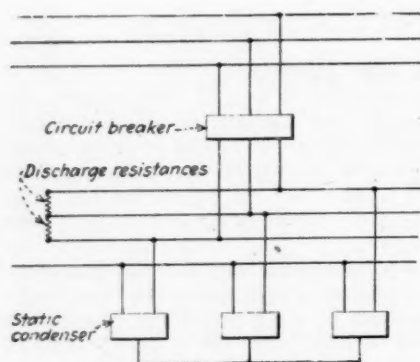


Fig. 2—Circuit Breaker Protects Condenser

the substation in a position, with respect to the power circuit, indicated in Fig. 1. The total cost, including installation expense, was approximately \$1,300. In a short time the investment paid for itself and revealed other advantages highly desirable from an operating point of view.

Recently, to ascertain the amount of savings effected by the static condenser, a comparison was made of the various power bills before and after the static condenser was put into operation. This investigation showed that the power saving amounts to over \$100 per month. The power bills in two instances cover equal consumptions of energy during certain months in 1924 and 1927. They are as follows:

October, 1924, 27,600 kw.-hr.....	\$784.24
August, 1927, 27,600 kw.-hr.....	661.51
Saving .....	\$122.73
April, 1924, 17,600 kw.-hr.....	\$685.81
July, 1927, 17,600 kw.-hr.....	561.22
Saving .....	\$124.59

These figures demonstrate the effectiveness of power factor correction by means of static condensers.

## Conduit Fitting Makes Rugged Terminal

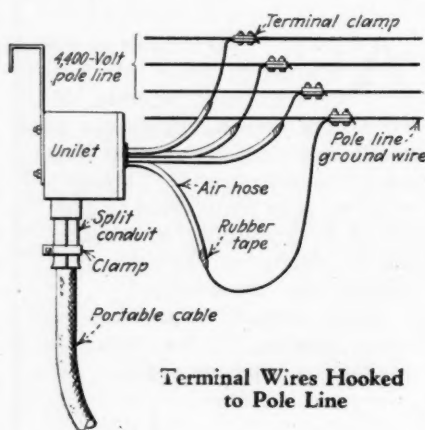
Several considerations are involved in the design of a terminal for a portable rubber-sheathed cable operating at 4,400 volts and feeding an electric shovel at a strip mine. Water must be excluded from the end of the cable, the arrangement must be such that the cable can be disconnected quickly from the pole-line wires, and the terminal must be sufficiently rugged to withstand being dropped several feet and being dragged over rough ground that may be covered with puddles of water.

The terminal is used at the top of a pole and therefore normally is out in the weather. For each 1,000 ft. of progress of the stripping shovel it must be disconnected from the lateral line and be moved to the next line. Because the shovels are worked 24 hours per day the moving must be done with the least possible delay.

C. H. Clayberg, chief electrician of

the Electric Shovel Coal Corporation, Clinton, Ind., has designed and built terminals which have proved entirely satisfactory in connection with two 8-yd. shovels. The "Tirex" portable cable, built to stand 6,000 volts, contains three No. 2 conductors each of which has a copper ground sheath over the conductor insulation. The over-all diameter of the cable is approximately 2½ in.

The terminal body is a standard "Unilet" type B fitting for rigid iron conduit. The blank composition cover is drilled to accommodate four pieces of ½-in. air hose which fit tightly in the respective holes. The three conductors and the ground wire are brought out through these pieces of hose. The hose ends are tapered and then made water tight with rubber tape.



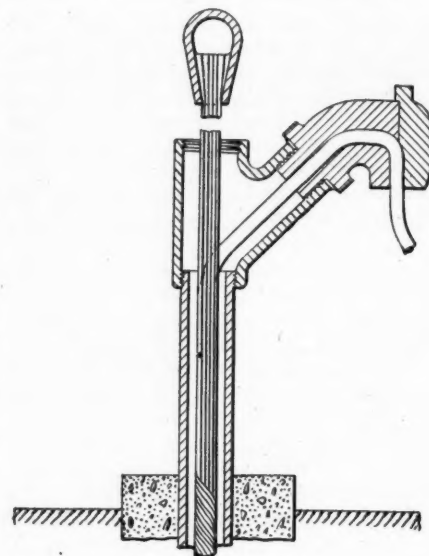
Screwed into the Unilet is a short length of 2½-in. iron conduit that has been split the entire length and flared at the unthreaded end. A clamp over the conduit holds the cable from slipping. The ground wire is connected to the three copper sheaths inside of the Unilet.

A hook fastened to the back of the fitting provides for hanging the cable terminal on a crossarm. The ground wire is made much longer than the power conductors, so that there is no reason for confusion when making the line connection.

## Borehole Suspension Is Easily Installed

Because the installation of a borehole cable suspension does not necessarily require the purchase of a special fitting designed for the purpose, many types of suspensions are in use. D. C. McKeehan, Rock Springs, Wyo., electrical engineer of the Union Pacific Coal Co., favors a suspension and cable terminal such as illustrated in the accompanying sketch.

A wire-rope socket, a Y-bend pipe fitting and an "FE" conduit are the parts required. The Y-bend is screwed to the top of the casing and the conduit attached to the side outlet. The armor wires carrying the cable are untwisted



Simple Yet Efficient

for several feet to allow bringing the cable out to one side.

The final installation is made as follows: After the wire-rope socket has been "leaded" to the end of the armor wires, the cable is lowered a few feet below its normal position. The ends of the conductors are then started into the side outlet and the cable pulled back and suspended in permanent position.

In dry climates, such as Wyoming, it is not considered necessary to seal the job. Sealing can be done by using a compound in the top of the Y-bend and in the conduit.

## How Proper Polarity Is Assured

In general, the scheme of control and protective equipment required for the satisfactory operation of synchronous converters follows very closely that for motor-generator sets, according to M. F. Packard and R. E. Powers, general engineers, Westinghouse Electric & Mfg. Co. The polarity of a synchronous converter depends upon the electrical condition prevailing at the instant of closing the contacts of the starting equipment. Therefore the possibility of its polarity building up in one particular direction is approximately 50 per cent.

To insure that the polarity of an automatically controlled converter will be correct before the sequence of the starting operation can be completed, a polarized motor-operated relay is incorporated in the equipment to indicate polarity and cause correction if necessary.

The field of the motor-operated relay consists of a permanent magnet. The armature of the motor is connected directly across the direct-current terminals of the converter. Therefore, the direction of rotation of the motor depends



upon the polarity of the converter. During the starting period alternating current of diminishing frequency passes through the armature of the motor-driven relay. As the converter reaches synchronous speed the frequency of the alternating current in the armature drops to zero and the motor rotates in a direction corresponding to the converter polarity.

When the polarity is in the reverse direction the motor-operated relay closes auxiliary contacts so arranged as to cause reversal of the field windings to allow the converter to slip a pole and correct its polarity. Upon correction of polarity the motor-operated relay rotates in the opposite direction to close certain auxiliary contacts and permit the starting sequence to progress.

## Use of Drag Scraper Aids In Disposal of Refuse

At mines where the hillside below the refuse dump is not steep enough to consistently carry the material away, a dragline scraper possibly may be used to advantage. Two of the drift mines of the Pruden Coal & Coke Co., Pruden, Tenn., are so equipped.

In each of these cases it happens that trees or stumps are available at approximately the right places for anchoring the tail pulley. The small electric hoist of the double-friction drum type, which drives the scraper, is installed on the track level close to the dump. The scraper dumps its load automatically at the edge of the pile.

At the Pruden mines this method of handling refuse is especially advantageous because drop-bottom mine cars are used. The rock dump has a permanent location on the main tramroad, and therefore the cars loaded with refuse can be dumped without being

cut from the trip. Whenever the refuse accumulates to the degree that it threatens to interfere with the dumping the condition is relieved by operating the drag scraper for a few hours.

## Workstands Save Backs And Raise Accuracy

No one piece of accessory equipment for use in machine shops at mines facilitates to a greater extent the work being done with machine tools than an adjustable work-support stand. Two different types of this device are shown in the accompanying illustrations.



Fig. 1—Convenient Work Stand

The type shown in Fig. 1 is being used in the central shops of the Berwind-White Coal Mining Co., Windber, Pa. The gear nest by which the screw jack is actuated was once a part of a gov-

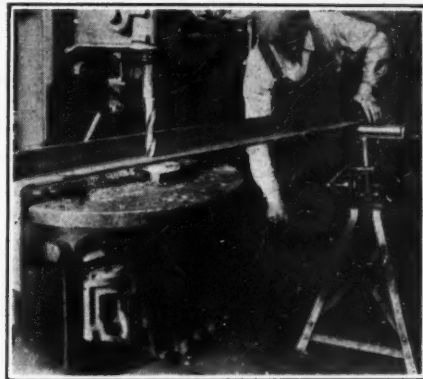


Fig. 2—Setting Up Made Easy

ernor on a steam engine. The advantage of this type, of course, is that the jack lifts mechanically the piece being handled.

In Fig. 2 is shown the type used by the Buckeye Coal Co., at Nemacolin, Pa. In a pipe resting on substantial base legs is telescoped a smaller pipe which is held in the position to which it is adjusted by a grip collar at the end of a check lever. With this type lifting of the job piece must be done by hand.

## Old Boiler Tubes Used In Manway Mouth

At many coal mines, particularly those having their own power plant, the boiler tubes or flues give way at intervals from various causes. Such material, when removed from the boiler, as a rule has only a small scrap value.

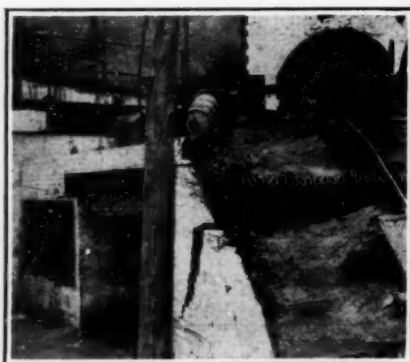
At the Banning No. 2 mine of the Pittsburgh Coal Co. a number of these old boiler tubes were used in building the mouth of the manway. It was necessary that this passage should support the tracks of the material slope, and the side track leading to the timber storage.

Empty Scraper Back Near Hoist



Dumping at Edge of the Pile





A New Use for an Old Product

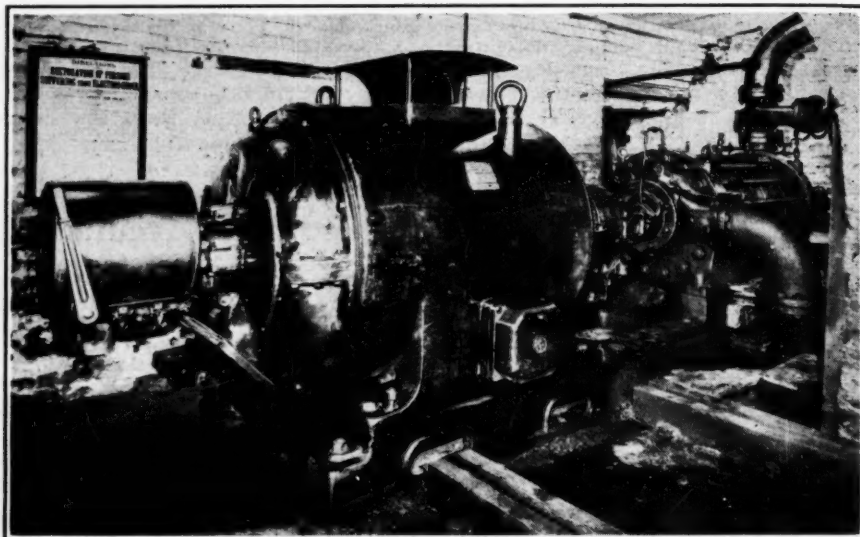
As shown, the driftmouth is made of brick and the old boiler tubes laid skin to skin across the two side walls. Dirt is placed over them. These tubes have been in use for several years, and look as if they would continue to give excellent service for years to come. By this means, a scrap material that perhaps could not be readily sold, is being put to a useful purpose.

### Siren on Mine Motor Blasts Warning

Many delays in haulage and collisions of mine-car trips have been avoided by the installation of a siren on main-line locomotives at the No. 6 mine of the Knott Coal Corporation, Anco, Ky. The coal from this mine must be hauled over a 2-mile outside tram which curves around the hills, passes through two old mines practically worked out and traverses a lengthy bridge spanning a deep hollow.

Two or three locomotives travel over this tram, so that ample warning as to the whereabouts of each at all times is necessary. The siren, which may be heard two or more miles away, has solved the problem. Since the installation of this warning device, three years ago, not even a near approach to a collision has occurred.

#### Look Out!



### Large Enclosed Motor, Submerged for Eleven Days, Is Dried Out in 80 Hours

PASSING current through the windings is the approved method of drying out large electric motors which have been submerged by flood. C. H. S. Tupholme, London, England, tells of a 450-hp. 6,000-volt centrifugal pump motor which was dried out, in place, by that method after eleven days submersion in a coal mine. The motor, which was of the three-phase, slip-ring induction, enclosed type, was built by the British Thomson-Houston Company. The coils were mica-insulated by the

Haefely process, form wound and impregnated.

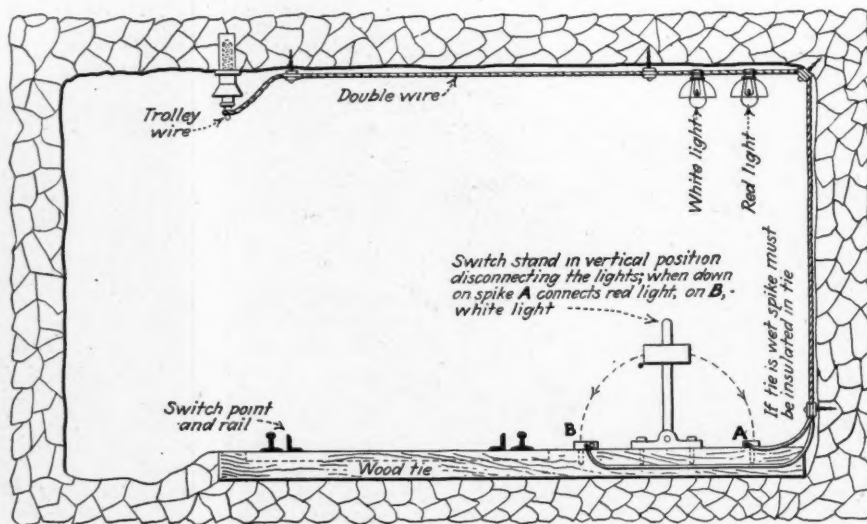
Before drying was begun, the motor was taken apart and the grease, mud and coal dust cleaned from the windings. After re-assembly, the rotor was short-circuited and alternating current at 22 amperes passed through the stator winding for a total of 80 hours. The periods were eight hours per day for ten days. Insulation resistance tests were made each day when the windings registered a temperature of 180 deg. F.

### Switch Lamps in Mine Speed Haulage

A certain West Virginia mine has speeded up haulage considerably and averted many wrecks merely by installing switch lights on the main haulways. As indicated by the accompanying sketch,

when the track switch is lined up for through traffic the white lamp shows; if the track switch is set for a turnout the red lamp burns and neither lamp lights when the track switch is in an open or neutral position. Where the switch tie is wet it then becomes necessary, of course, to insulate the switch contacts.

#### This Switchman Never Sleeps





# NOTES

## *From Across the Sea*

MANY mine disasters have been due primarily to ignitions of methane and secondarily to the ignitions of coal dust by which they were followed. The explosion at Mather is an instance. Consequently the percentage of inert dust needed where gas is likely to be present should be given and has received consideration. In the 1926 report of the Safety in Mines Research Board of Great Britain it was stated that for every 1 per cent of firedamp in the air about 5 per cent more incombustible dust must be added to the coal dust to render the mixture incapable of propagating flame. Thus if 65 per cent of inert dust should be present where there is no methane, 70 per cent will be needed where there is 1 per cent and 85 per cent where by some unfortunate accident 4 per cent of methane is present.

In the more recent report, just issued, it is stated that: "With certain coals of low-volatile content it has been found that a greater proportion of incombustible dust than this is required." Tests are being made to further develop this fact.

The same report declares that the striking together of metal and rock, or rock and rock, in exceptional circumstances will raise the temperature of the surface struck to such a degree that firedamp will be ignited. The report goes on to say that in recent experiments firedamp has been ignited in this way when certain kinds of hard sandstone are used and that this was caused by an expenditure of energy comparable with that resulting from the fall of a few pounds of rock for a distance of 5 to 6 ft. "The possibility of firedamp being ignited in the mine in this manner must therefore be faced. On the other hand, frictional sparks, such as may be produced in brilliant showers when a metal tool strikes rock or when some kinds of rock strike against each other, cannot ignite firedamp."

THIS will not satisfy some in this country who declare they have seen sparks from chain cutters ignite gas. Thought will convince them that, with observations such as they made, they were quite unable to decide whether it was the sparks or the heat of the bits or of the material cut that caused the ignition. Conversely, it would be interesting to learn how and why the British investigators concluded that it was the heat of the cut and not the sparks themselves that ignited the methane.

Certain it is that the mining man gets no great degree of consolation from the statement of the Board and doubtless the Board did not intend that he should. Apparently a cutter may conceivably so heat the cutter bits or the fragments of

the undercut as to ignite gas even without the formation of sparks.

We begin readily to understand why Spedding's fire wheel of steel striking against flint proved dangerous. The flint was heated so much in the process of making illuminating sparks that it ignited gas. The sparks might be harmless, but the manner of their generation proved the undoing of the device. That friction, even when it fails to strike "fire," may ignite gas is the burden of this statement of the Safety in Mines Research Board, even though that thought is nowhere expressed.

Obviously the importance of the use of water on cutter bits is indicated not merely because it allays dust but because it reduces bit, and perhaps cut, temperatures. Recently in a mine a machine cut through a pillar and men on the opposing side were surprised to note the brilliant display of sparks that the bits generated, which display usually is buried in a pile of slack. The use of water on cutter bars has the further advantage perhaps that it saves the bit from losing its temper.

In this connection it may be suggested that coal dust which still retains its "quarry sap," to use the expression of quarrymen, should be more easily and efficiently moistened when drenched as soon as it leaves the cutter points than it could be after having become dried and perhaps oxidized on the surface. Furthermore, the addition of water is not to a mass of dust but to dust which has not yet agglomerated. But in stating these surmises a departure is being made from the terms of the Board's report.

Disturbing as is the statement that hot cutter bits may ignite gas is a declaration that a compressed mixture of methane and air is ignited much more readily than one that has not been compressed. Prof. H. B. Dixon, acting for the Board, has been making tests at Manchester University to determine ignition temperatures when firedamp mixtures are thus compressed, the inquiry arising out of the knowledge that explosives compress the air of the face in escaping from a breached borehole or when blowing out a shot. "A jet of methane," says the report, is ignited at 735 deg. C. when at atmospheric pressure. Raising the pressure to seven atmospheres, the temperature of ignition is 653 deg. When the most sensitive mixture of methane and air (which contains 7 per cent of methane) is rapidly compressed to 29 atmospheres its ignition temperature is only 450 deg. C.

Under W. F. Higgins also has been determined for the Board the effect of mixtures of gases in changing the temperatures of ignition of any one gas. Water vapor, some have assumed, always reduces the violence of an explosion. It even has been asserted by some engineers without laboratory experience that water vapor in the air of a coal mine renders an explosion less likely to occur, altogether apart from its wetting effect on the coal dust and ribs. Even though this viewpoint is less often heard today, it is now known that water vapor takes an important part in the combustion of methane. W. F. Higgins has determined that at all pressures the addition of water vapor to air lowers the temperature at which carbon monoxide will burn until 5.5 per cent of water vapor is reached. The same is true with a mixture of carbon monoxide and oxygen. In this case water vapor aids combustion. Being a gas, water vapor does not act like water as a quenching agent.

*R. Dawson Hall*

## *On the* **ENGINEER'S BOOK SHELF**

*Robb's Patent Essentials; 445 p., octavo; by John F. Robb; Funk & Wagnalls Co., New York City. Price, \$5.*

For those who have invented new devices or processes—and who in these days has not?—Robb's book on patent essentials will be welcome. It describes the manner in which the Patent Office acts, the quality of a patentable invention, the law regarding infringement, both common and contributory, and the valuation and depreciation of patents. It has articles on invention as opposed to mere mechanical skill which is not patentable, on combinations of parts as against mere aggregations which cannot

be made the basis of a patent, on mechanical processes and functional claims and on the joinder of two or more inventions under a single patent.

The book shows how patent claims should be drafted, what rules have been adopted by the Patent Office, how appeals should be made, how patents may be renewed, reissued and abandoned and what constitutes double patenting. It then discusses design patents, assignments, contracts and interferences and ends with special forms and procedures and the patent law of 1927. The book is prepared for executives, engineers, lawyers and inventors and seems well fitted for their needs.

# COAL AGE

Published by McGraw-Hill Publishing Company, Inc.

JOHN M. CARMODY, Editor

NEW YORK, JULY, 1928

## *Mechanization and maintenance*

**I**NCREASED mechanization throughout the coal industry tends day by day to put the spotlight on maintenance of equipment. cursory inspection and occasional oiling or greasing no longer gets results. Increased capital investment and competitive markets demand that all equipment be kept in the best condition.

This means that competent men, thoroughly trained, must be employed to make regular inspections of every working piece of machinery. It means, too, that every operating official must realize that time lost through defective equipment is gone forever but appears as sure as fate in the cost sheet—a waste that can be avoided by good management.

Daily cost sheets that take account of delays by causes offer an excellent opportunity to save money. An example of this is shown in the minute data gathered by the better strip managers in the account of the Boonville operation of the Sunlight Coal Co. elsewhere in this issue of *Coal Age*. Coal mining machinery, like automobiles, gives best results when examined daily and repaired quickly as small defects are discovered.

## *Once a miner, always a miner*

**T**HAT immobility of mine labor that has prevented miners from leaving the mining industry for other forms of labor arises largely from the practice, hitherto almost universal at coal mines, of giving all the men work that can be engaged for as many days in the year, month or week as the market will permit. In many other industries men are discharged when business decreases and a few of the more desirable, the married men or the men in one or more plants are given full time. Those who are laid off leave and probably never return.

Perhaps the method of the coal industry is the more kindly. The union and the men seem to favor it. In the long run, however, it may have unfortunate results for those who labor in the industry. Its overmanning tends to become permanent and a brief period of complete idleness is avoided only to perpetuate a condition of irregular employment.

Other causes tending to make mine labor immobile are the isolation of the mines from other in-

dustrial enterprises, making it almost necessary for married men to migrate with their entire families if they would change their manner of livelihood, unfamiliarity with urban life and a distaste for it, dislike for labor in extreme temperatures and a strong objection to close supervision.

Nor is the coal operator more mobile than the mine worker. He does not change his occupation readily. If business gets bad he opens another mine in some more fortunate district or in some more favorable spot in the same district.

## *Explosions choose what men refuse*

**R**OCK-DUSTING to be effective must be adequate not only in the tracked roadways but in the other passageways also. It is easy to get great comfort from the adequate rock-dusting of the traveled entries, but how does the mine explosion know it is expected to choose these pathways to the exclusion of others more inviting? An explosion prefers for travel roads men would not think of using for that purpose.

It is likely to prefer to travel by the untracked roads because in these there is less, or no, rock dust, there is fine coal dust that has been generated at the face by mining operations and has been deposited in the return, and there is the turbulence in the passage of the explosion which means combustion efficiency in the mine airway just as certainly as it does in the pulverized coal furnace. The untracked roads have fallen rock which causes pressures to build up. That the pressures increase in timbered roads and in constricted areas of passages has been proved frequently by experiment. Untracked roads may contain no timber and may be straight but usually are cumbered with fallen rock.

One of the reasons for the inefficacy of sprinkling, a practice once so highly commended, came from the fact that only one heading or two in a group of many headings could be sprinkled, and the explosion showed a preference to travel the roadways that had not been so treated.

Let it not be forgotten that Mather, the mine that exploded on May 19, was, according to ordinary standards, a well rock-dusted operation. According to reports the traveled roadways were well coated with inert dust. Mather had barriers on every split. From the time of introducing the practice of rock-dusting the management required that every heading and crosscut be rock-dusted before the track was drawn. In almost every instance this was done, according to information received. The rooms were rock-dusted by blowing in dust from the neck at the heading. The methods pursued were such that Mather was one of the few mines that received the full rebate in its insurance rating for adequate rock-dusting. Yet when the time came the provisions were found inadequate.

This was partly due to the fact that a large dis-



charge of methane occurred at the point where the explosion initiated. It may be surmised that this condition was greatly aggravated by the omission to close a door and that when the door eventually was closed a large quantity of gas traveled down the return airways. It may be further surmised that this gas enabled the flame to travel past the freshly rock-dusted trackless entries to those where the rock dust was well covered with drifted coal dust.

The explosion nevertheless was nearly extinguished en route, as shown by the condition of the stoppings. It picked up energy later and, getting into a rib line, surpassed itself in fury. Yet, in all probability, rock dust ultimately extinguished it.

Those operators who would speak lightly of Mather's rock-dusting would do well to look to their own provisions in this direction. One can find operators almost everywhere who are positively proud of their rock-dusting, and yet they have not done as well as Mather. Fortunately, they have not struck the concatenation of circumstances that made that mine a hecatomb. Mather has learned its lesson, and it is to be hoped that other mines will profit from the record.

### *Unpleasant coincidence*

**D**ESTRUCTION of a tippie of a mine in southern Indiana and another in northern Illinois upon the eve of resumption of operations under working arrangements unsanctified by the United Mine Workers of America must inevitably arouse ugly suspicions. The synchronization of destruction with the determination to operate free from union domination, following as it does a series of major and minor disturbances in other sections where the union and the coal operators have parted company, is a coincidence provocative of unpleasant speculation. No one should be more anxious to fix responsibility for this lawlessness and push punishment of the guilty parties than the officials of the United Mine Workers of America. Arson and dynamite are not real friends of labor.

### *If water, why not air?*

**W**HEN one notes the large quantities of water passing through the roof and the floor of coal seams and even through the coal seam itself, one cannot wonder that air travels in the same way and so makes light of the tightest of stoppings, especially when heavy shots have shattered the measures. Only big pillars with few crosscuts will give the necessary tightness to airways, but as water will travel through thousands of feet of open rock, even this seems an uncertain recourse.

In Great Britain rock dust has been applied to coal pillars to make them impervious to air so as to

prevent by this means the development of spontaneous combustion. It is probable that the top and bottom rock when brushed are even more greatly in need of such treatment than the coal itself.

The importance of conserving air grows with the increase in the size of mines. When water gages are increased to 8 and 10 in., as in foreign countries, leakage will be augmented unless provision be made to prevent it. Even in this country at one place such a high pressure as 8 in. of water gage may be found.

### *Serving the whole field of business*

**E**XTENSION of the McGraw-Hill publishing activities to every branch of American business is the most significant effect of the merger of the A. W. Shaw Company, of Chicago, and the McGraw-Hill Publishing Company, announced elsewhere in this issue.

Heretofore the magazine-publishing activities of the McGraw-Hill organization have been confined to specialized service to major engineering industries and the trade channels for distributing their products. The book division of the organization, it is true, has long since broadened its scope; it publishes books not only on engineering, management and industrial subjects but on general business and scientific agriculture.

Through the merger the McGraw-Hill institution now acquires a medium by which it can speak to the whole range of American business. *The Magazine of Business* has a circulation of more than 150,000 copies and deals with the problems fundamental to all business — such as those of finance, production, distribution and sales, management, transportation and export trade. It treats, as well, those major movements in legislation which bear upon business, such as taxation, tariff and government regulation.

The importance of this new extension of the McGraw-Hill activities is apparent to all who have followed the standards which, under the leadership of James H. McGraw, have dominated its publications. To give through effective organization, the best of which they are capable, is his constant admonition to the publishers and editors working under his direction. It presages a virile development of an already effective service to the whole business structure of America.

Further, it is significant that in referring to *The Magazine of Business*, Mr. McGraw in his announcement of the merger, closed with these words: "It will fight for the interests of business but it will place in an equally important position the responsibility of business to the public. It will, in a word, stand for true business statesmanship."

Past performance in McGraw-Hill papers is a warrant that this pledge will be fulfilled.

# *The BOSSES*

## *Talk it Over*



### *Controlling Day Labor Costs*

**"I**T SEEMS to me," said the Old Man, "I never saw a mine with as many daymen in it as this one. Every four or five months we have a house-cleaning and offer loaders' checks to a gang of daymen. What is the reason for the increased track-laying and gathering cost in section 4 last month?"

Mac, the general foreman, didn't wait for the super to reply. He had been all set to answer that question for the past week. "It's hard to keep loaders in section 4. The slate is thick and half of the men left when Laurel Run started up last week."

"That's just it," retorted the Old Man, "When the tonnage drops the number of daymen remains the same. Why didn't you let some of them go, too?"

Mac did not answer. Back in his head he had hoped he could get some new loaders. But the fall run had started and men were pretty scarce.

Jim, the super, had been giving the problem of daymen considerable thought of late. He believed in giving the general foreman a fairly free hand in regard to hiring men. "I believe," he said, "we would get along better if we had a definite understanding of just how many daymen should be used to put out a given tonnage."

"Just so," replied the Old Man. "A standard force. That's the best suggestion I've heard yet. And there's another thing while we're on the subject. You and Mac get your heads together and work out some arrangement which will enable both of you to check up on the amount of work done by daymen. Every man does more when he and the boss have a definite understanding as to what is a day's work. Let me know what you think when I come out next week."

*Can day labor costs be held at a minimum by using a standard force or labor budget?*

*If you were Jim and Mac and your tonnage fell off, how would you handle the day labor situation?*

*Are production reports from daymen practical?*

**All foremen and superintendents are urged to discuss these questions  
Acceptable letters will be paid for**



# Increased Lump a Much Sought Goal

## Production of Lump Coal Is Increased by Shearing

**I**N THE production of lump coal and other sizes larger than slack there are several things to take into consideration. Among these are freedom of the coal from sulphur bands, the friability of the coal and the knowledge of the men in charge of the shooting. Shooting requires proper charging, placing and tamping of shots to get the best results.

The shearing of a coal face should increase the percentage of lump coal as it furnishes a free end for the shot with the result that less powder is required to break down the coal. This decreases the shattering effect of the explosive on the coal and increases the proportion of larger sizes produced in rooms or entries. The explosive cost is less and the product will better withstand handling while in transit from the producer to the consumer.

While the shearing produces more cuttings this increase will be offset by more lump coal, which should command a better price on the market. Preparation of coal for market cannot all be done at the working face but requires a good outside plant where it can be properly sized and any impurities missed in the mine removed. J. A. R. Sullivan, Ind.

## Says the Old Gent Is Right

**I**NCREASED percentage of lump coal at the working face is a factor that deserves a great deal of thought so as to adopt the right system in order to obtain maximum results. I am of the opinion that the Old Gent is quite right in his statement that the increase in larger sizes will overcome the increase in slack due to the extra machine cuttings, for there is no question that the extra (shearing or vertical) cut will give the coal an additional free face which will considerably reduce the quantity of explosives used in bringing down the coal. This method will bring about a greater percentage of lump over their present system of undercutting.

I further believe that Mac also is right in his statement that it will increase his operating cost, but not to the extent of the extra pay the machine men will receive for the extra cut, because, by the adoption of the contemplated system, the tonnage per loader will be considerably increased. This in turn will raise the tonnage per man employed and should automatically give approximately the same cost as at present, with a considerable increase in the percentage of lump, which usually brings a better market price than finer grades.

I do not believe that Jim, Mac or any other operating man would make a mistake by adopting combination cutters

in order to obtain more lump coal regardless of the efficiency obtained in drilling and shooting. However, the location of drillholes, the grade, quantity and kind of explosives used are always points to be carefully considered in obtaining more lump coal regardless of the seam worked. C. T. GRIMM. Adrian, W. Va.

## Lump Problem Up to Operator; Little Incentive for Miner

**S**OME years ago when the miners in the bituminous coal field demanded pay for their coal on a mine-run basis, and got it, I knew the lump-coal problem would be a result. Now there is no direct incentive for the miner to produce lump coal except to build or chunk up the cars and even this incentive is waning in importance to the miner. Now the problem is squarely on the shoulders of the operators alone.

How to produce more lump coal is described in *Coal Age*, March 5, 1925,

best quality coal are the ones that will survive.

In narrow or fast side places, shearing will certainly do much to increase the percentage of lump produced. It may increase the cost of labor in one direction, but will decrease labor on the whole; less explosives will be used, with lower cost for handling, hauling and less cost to ventilate the mine, etc.

Shearing will increase the tonnage per loader, since the coal will be shot down so that it will be easier to load. In tender seams it will certainly pay well to shear, if the highest percentage of lump coal is to be produced, even where the most suitable explosives are used and the best judgment is shown in the drilling and placing of the right quantity of such explosive. Center shots in rooms ought to be loaded out, if possible, before rib shots are fired. Snubbing ought to be done, where possible, whether sheared or otherwise.

W. H. LUXTON.

Linton, Ind.

## Shearing Should Not Be Used Without Full Investigation

**S**HEARING in a majority of cases results in enough additional profit from the sale of lump coal to warrant its adoption. In several mines, however, modern shooting methods may be depended upon for increase in lump production. The necessity of purchasing a shearing machine, therefore, is eliminated.

It is an evident fact that the increase in slack from machine cuttings is overbalanced by the increase in lump. This increase results from the use of smaller powder charges. Heavy shooting produces more slack than all the operations of cutting, shearing, handling and transporting together. In addition, breakage during transportation is aggravated by the previous blasting operation.

The reduction in quantity of explosives would be 50 per cent in practically all mines and even greater in a few, as the coal does not tend to stick to the roof and may break down of its own weight. Where this happens only a small amount of powder is required to break it up. Even if the cut does not break down, the amount of explosive is not greatly increased. The miner can load more, as the roof conditions are better and the impurities are not broken up so fine as to require considerable time to remove them. Timbers also may be kept closer to the face without danger of being blown out.

The cost may be increased, as extra labor, machinery and supervision are required, but that is considering only one side of the question. If the increased cost gives a fair profit from increased lump production, any man would be working to the interests of his company by adopting shearing. If I were in con-

**E**XPLAINING your point of view to the readers of *COAL AGE* may clarify your ideas when you come to state your case to your chief executive, partners, shareholders, associates or employees.

pages 353-55, where it tells of how a 50-50 per cent output was changed to over 90 per cent lump production. Longface methods are those from which the largest percentage of lump can be produced; many mines now worked by other methods could be readily changed over and bring to the operators many other advantages, economies and greater efficiencies, as told in the article before mentioned.

In an article in *Coal Age* of May, 1928, R. Y. Williams tells how the value of coal produced was enhanced 22 per cent through increasing the lump coal 14½ per cent by using longface methods in place of the room-and-pillar system.

Longface operation is the only salvation for coal producers to save their capital from becoming a total loss. It is a well-known fact that there are too many mines and some must be and are being eliminated; the mines that produce the

trol of drilling and blasting and had a satisfactory explosive, I would consider shearing as a means of increasing lump.

I would not adopt any new method, however, without examining it from the standpoint of profit and safety, as well as the advantages and disadvantages of operation under the conditions encountered in my mine. If I could see a fair profit on the investment in shearing equipment, considering the life of the mine, I would take steps to install it; if not, I would try to get better results from the methods already in use.

H. T. WALTON.

Wolfpit, Ky.

### Shearing Not Advised Until Other Methods Have Been Tried

IT DEPENDS on the seam of coal Jim and Mac are working and the size of cars they are using whether the Old Man is right in saying that increase in the larger sizes will overcome the increase in slack due to extra machine cuttings. There are mines working today where the management is after the superintendent and the superintendent after the mine foreman for more lump coal and less slack, while at the same time the management has a type of mine car in use not suited to the seam being worked, as there is not enough room between car and roof to load lumpy coal. The remedy would be to get lower cars.

To produce more lumpy coal let Jim and Mac shoot the center shot first and have the loaders load this coal out before shooting the rib shots. I am sure this method will increase the amount of larger sizes. Of course this would not apply to all mines and all different seams of coal worked. In one mine shearing might increase the yield of larger sizes, while in another there would be an increase in screenings. I would advise Jim, Mac and the Old Man to use all the known methods of increasing lump production before investing in a shearing machine.

Mac is right in saying that it will increase the mine cost to install a shearing machine if he can produce, in the seam he is working, the same amount of larger sizes with other methods.

JOHN BOHN,  
Mine Foreman.

Hooversville, Pa.

### Increase in Slack Justified By Greater Amount of Lump

IN REGARD to getting more lump coal, the Old Man is right when he says that the increase in lump will more than justify the extra amount of slack made by shearing. When a cut is to be shot, the matter of placing the shot is not so important if it is strong enough to bring down the coal. All coal shot by explosives may appear to be in nice lumps, but will crumble easily upon exposure to the atmosphere or upon receiving slight jars or knocks in transit, because of powder cracks.

Several years ago some coal operators in the North of England insisted on the coal being sheared before it was

shot, because they claimed it resulted in better coal. The miners objected, however, so a mixed committee was sent to the Baltic ports to examine the coal as it came in. Some of the cargoes examined consisted of sheared coal, while others were of coal shot without shearing. The committee finally concluded that the sheared coal landed in far the better condition, and, as a result of their findings, shearing was adopted.

There can be no doubt that the market demand for the larger sizes of lump coal will take care of the extra cost of shearing. In addition, shearing will reduce the hazards to the loader. Taking the tight shot out always is hard and dangerous work, especially the removal of the last piece in the top; which starts things rolling. The cost of explosives also is reduced, as well as the number of shots which must be fired. Decrease in the number of shots fired reduces the chance of accidents.

The Old Man is right about increasing the tons of coal per loader—that is if Jim and Mac are prepared to handle it—as sheared coal properly shot comes down without picking and pinching to get to the back so the bumps can be shot. As a result, the loader has more time to work with his shovel. In addition, shot-holes for the snubbing and tight shots would not be required. The reasons given above convince me that a larger production of lump coal would result if shearing were done.

ROBERT EMERY.

Neffs, Ohio.

### Mine Conditions and Layout Are Factors in Distribution

DISTRIBUTION of mine cars at the working face is the bone of contention at the majority of coal mines. Few miners employed at the working face work more than four to six hours of each 8-hour work day. That in itself shows that human labor is an expensive substitute for equipment.

The gathering haulage system should be worked out from the superintendent's office in the same manner as any other work pertaining to the mine—depending upon the layout of the mine. First consideration, of course, must be given to the conditions under which the motors or mules may be working. In some mines the gathering motors have as far to haul the coal from the face to the parting as the main-line motor has from the parting to the shaft bottom or the outside. It isn't always a case of lack of cars but the system of distribution.

The partings should be shown on the projection of a mine map for future work and practically standardized throughout the mine. The partings should be put in when the mine reaches that point, as called for on the projection, and placed in operation as soon as convenient. The layout of the workings also should be considered. In panels, for instance, where rooms are turned both in the panel and the aircourse, sufficient men should be

placed there to make a worth-while trip for a motor.

If there are, say, ten men on each entry, the motor can take that many empties in one entry to take care of the men; go through the crosscut at the head of the entry and commence picking up loads, provided the men spot their own empties. If the grades be too steep for this the motor could push the empties in the entry and spot each car at the face. Where the rooms are driven only on the one entry and the coal seam is very uneven that would govern the number of cars a motor could handle.

Where grades are stiff the pull and place system can be used to great advantage. With twelve men on the panel they could be changed in threes or fours. Three or four of these men always would have loads; the motor, coming in with four more empties, would spot them in the places that required the cars, pick up the loads and get back to the side track, continuing this system all the way around. Enough men should be given one motor to keep it busy and also to obtain the maximum tonnage from each man. The work should be concentrated to secure the greatest efficiency from the motors. If the rooms go to any great depth the switch which is usually laid to load out breakthrough coal can be utilized to pick up the next room, thereby eliminating needless track and making for efficient haulage.

Jim's natural conditions seem to be against him, but that could be taken care of by any of the above methods. Where development work is extensive no motors should be allowed to run light from the face to the partings, as this is a case of lost motion. Where entries are anywhere from 500 ft. to 1,500 ft. in length empties should be taken in with the motor to change these places.

Satisfied men mean a lot to the mine management and keeping them well supplied with mine cars will tend to keep them that way and also attentive to their hundred and one duties. It gives a man great pride to talk about or show his pay envelope if he has been kept busy loading the maximum amount of cars throughout the month. Some claim that when a man has too many cars to load it makes him neglect other duties such as timbering, shooting, etc.

Usually it is only the dissatisfied man who is indifferent, in my opinion. A satisfied man is the most careful man and is an asset. There is a wonderful field for the engineer in the mines today in working out this problem, and it can be done satisfactorily. Intelligent effort along this line will bring these money-getting results: (1) Increased efficiency of the men; (2) promotion of loyalty and co-operation; (3) reduction of labor turnover to a minimum; (4) increased production without additional cost. I think that Jim and Mac should welcome the efforts of the engineer and co-operate with him.

W. W. HUNTER.

Mount Hope, W. Va.



## Correction of Power Factor More Than Pays for Itself

A POWER load with a power factor below a certain limit usually is penalized by power companies in England. The power factor should be kept as high as possible—if necessary installing condensers or other apparatus to improve it—synchronous motors should be used where possible and their power-factor correcting properties used.

A common cause of a low power factor is using a number of squirrel-cage motors only partly loaded. The power factor of these motors always is

low even at full load; as the load falls off the power factor drops until at half load it becomes very low. These motors should be run as near full load as possible, and in the average plant much can be done in this direction as motors frequently are run below their capacity to reduce the risk of breakdown. Wherever possible they should be replaced by synchronous motors. Formerly these were commonly thought unsuitable on account of their inability to start against a load, but now they can be first started up and then connected to the load by a magnetic clutch which applies the load gradually and is largely used with these motors.

If the power factor can be kept sufficiently high by using these motors any penalties will be avoided—without penalties the wattless current is not paid for as it is not registered on the meters. There also is an indirect saving, as this wattless current has to be provided for in the cables, etc., in the same way as useful current, and often an improvement in power factor will enable the existing cables to carry the load where extensions would otherwise have been necessary or they will carry the same load with less loss.

Where it has been necessary to install special correcting apparatus such as condensers or Kapp vibrators, in most cases it has been found that the cost of these have been saved in less than 18 months. It does not pay to try to raise the power factor to unity, as the cost of the apparatus increases rapidly as the power factor gets higher, 0.9 usually being as high as it is advisable to go. I think that the synchronous converter still has a place in the mining field, providing its efficiency compares favorably with other converters.

The automatic power-factor control properly handled should be invaluable. I have no figures relating to a specific instance where power costs were reduced owing to power-factor correction, but where this has been effected the initial and operating cost have been saved in less than two years—this is an average of many plants. In some cases the cost has been saved in twelve months.

The losses due to a bad power factor are indirect—there may be a penalty from the power company, there is the loss of capacity in the mains, converting plant, transformers, etc., which may make it necessary to install a new plant which would be unnecessary if the power factor were high. There also is the faulty regulation of the load, which affects any other plant on the line. Where the power factor is in the neighborhood of 0.6 raising to 0.85 or 0.9 will show great savings; above 0.9 the savings drop off owing to the greatly increased capacity of the correcting apparatus necessary as the power factor rises.

The mine foreman's part in saving power is to see that all motors in his department are run at the load where their power factor is highest. Where a motor is connected to a load

where it will have to run for long periods underloaded, avoid the use of induction motors, using instead a synchronous motor or an a.c. commutator motor with a higher power factor. Keep all plants in good condition. The air gap in induction motors should be as small as possible as the power factor falls as the air gap increases.

Brentford, England. W. E. WARNER.

## Trade Literature

Slabbing Machines. Goodman Mfg. Co., Chicago, Ill. Pp. 20; illustrated. Standard overcutter, low-vein undercutter and mounted bottom cutter are described.

The Delta-Star Electric Co., Chicago, Ill., describes in bulletin No. 31-F its new line of unit type low-voltage spool and insulating supports. Bulletin No. 31BA describes a new line of low-voltage bus supports for voltages from 220 to 4,500.

Design and Application of Traveling Grate Stokers and Design and Application of Forced Draft Chain Grates, by T. A. Marsh, are two reprints from *Power* recently issued by the Combustion Engineering Corporation, New York City.

Herringbone Gear Catalog No. 36, issued by the W. A. Jones Foundry & Machine Co., Chicago, Ill., is a 24-pp. booklet describing an improved method of generating herringbone gears.

The Parker Appliance Co., Cleveland, Ohio, has issued a booklet containing instructions and specifications for installing tube couplings and copper tube in buildings, power plants, etc.

Plugs and Receptacles. Crouse-Hinds Co., Syracuse, N. Y. Bulletin 2111. Pp. 16; illustrated.

Angle-Compound Power-Driven Air Compressors. Sullivan Machinery Co., Chicago, Ill. Bulletin 83-J. Pp. 32; illustrated. Capacities from 300 to 5,100 cu.ft. of free air per minute are described.

The Ohio Brass Co., Mansfield, Ohio, has issued a catalog supplement designed to fit inside the front cover of the O-B general catalog No. 20. It contains a description and ordering information for 28 new mining and electric railway devices.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has issued Leaflet 20,356, Baldwin-Westinghouse Mine Locomotives, 4-pp. folder containing illustrations, plan and elevation drawings and mechanical, electrical and performance data on 15, 20 and 22½-ton superpowerful locomotives.

Lopulco Unit System for Burning Pulverized Fuel. Combustion Engineering Corporation, New York City. Catalog U-3. Pp. 27; illustrated. Describes the burning of pulverized fuel by direct firing.

Following is a list of recent publications of the General Electric Co., Schenectady, N. Y.: GEA-166A, Alternating-Current Crane and Hoist Motors; GEA-403A, CR3900 Drum-type Switches for throwing small alternating- or direct-current motors across the line; GEA-832, Portable Oil Testing Sets; GEA-753A, CR9516 Shoe-Type Solenoid Brakes for alternating- and direct-current motors; GEA-751, Combination Trolley-Wire Suspension and Guard Board Support for Mines; GEA-973, CR3100 Drum Controllers for Series, Shunt- or Compound-Wound Direct-Current Motors; GEA-953, Type R Steam Turbines, condensing and extraction types; GEA-957, Mechanical-Drive Turbines; GEA-979, CR2960-SY104A and SY103A Control Circuit Switches; Motor-Driven Mine Hoists, partial list of motors supplied by the General Electric Co. to May 1, 1928.

## Publications Received

A Way of Order for Bituminous Coal, by Walton H. Hamilton and Helen R. Wright, with the aid of the council and staff of the Institute of Economics. MacMillan Co., New York City. Price, \$2.50. Pp. 365.

Report of the Department of Mines of Pennsylvania, Anthracite, 1923-1926. Part I covers in detail operations in the 25 anthracite districts. In two sections, the first having 104 pp. and the second 110 pp.

Year Book of the American Engineering Standards Committee. Forty-nine new standards and 40 new projects are listed covering various industries, including mechanical, electrical, mining, safety, etc. Pp. 87.

Powdered Coal and the Coal Industry, by H. W. Brooks. Report of research committee, National Coal Association, Washington, D. C. Pp. 29, illustrated. Covers the history and present status of powdered coal.

Power Capacity and Production in the United States. Water-Supply Paper 579. U. S. Geological Survey, Washington, D. C. Pp. 210. Papers by C. R. Daugherty, A. H. Horton and R. W. Davenport.

Robb's Patent Essentials, by John F. Robb; new and revised edition; pp. 485; illustrated. Price, \$5, net. Includes the 1927 revisions of the patent laws, brings the law of employer-employee rights up to date and adds new forms of value.

Propagation of Flame in Mixtures of Natural Gas and Air, by H. F. Coward and H. P. Greenwald. Bureau of Mines, Washington, D. C. Technical paper 427. Price, 10c. Pp. 28; illustrated.

Experiments in Underground Communication Through Earth Strata, by L. C. Ilsley, H. B. Freeman and D. H. Zellers. Bureau of Mines, Washington, D. C. Technical paper 443. Price, 20c. Pp. 60.

Fencing and Other Safety Precautions for Machinery at Mines. Safety Pamphlet No. 5. Mines Department H. M. Stationery Office, Westminster, London, S.W. 1, England. Price, 6d. net. Pp. 53.

Undeveloped Mineral Resources of the South, by Dr. H. M. Payne. American Mining Congress, Washington, D. C. Price, \$5. Pp. 358.

Scientific Purchasing, by Edward T. Gushee and L. F. Boffey. McGraw-Hill Book Co., Inc., New York City. Price, \$3. Pp. 196.

Safety in Coal Mining (a handbook), by George S. Rice. Bureau of Mines, Washington, D. C. Bulletin 277. Price, 25c. Pp. 141. Deals solely with accidents in coal mines and with the means of prevention that have been determined and officially approved by the Bureau or tentatively suggested by certain of its members.

# WORD *from the* FIELD

## Conference of Interests to Aid Coal Industry

Organization of a Coal Industry Conference which shall include representatives of the operators, the wholesalers, the retailers, the railroads and the manufacturers of equipment sold to the coal industry was recommended in a report of a special Committee of Fifteen in a meeting at New York City, June 11. This committee was the outgrowth of an inter-organization conference held at New York on April 27 to discuss the proposal for a national coal week advocated by Harry Turner, a retailer of Topeka, Kan. At that meeting the Committee of Fifteen was authorized.

The report of the committee read as follows:

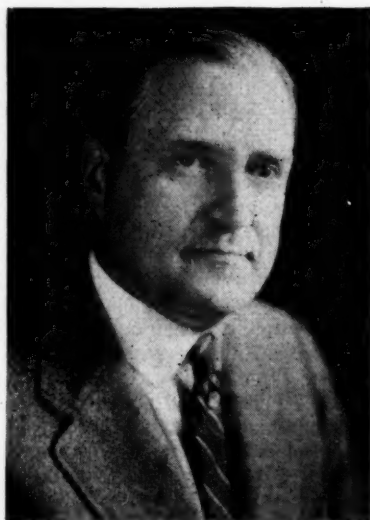
Your committee reports that the fundamental issue involved is the co-operation of all interested in the production, transportation, distribution or use of anthracite or bituminous coal, including those interested in the manufacture or sale of devices or services connected with its production or use with a view to securing beneficial results not obtainable through existing independent agencies.

This being our conviction, we feel that such an all-inclusive organization, if adequately supported, would accomplish inestimable good to all concerned. If this idea is approved by the Coal Industry Conference we suggest that a representative committee be authorized to confer with existing associations with a view to securing their endorsement and the naming of three representatives to act as delegates at an organization meeting to be called by the chair.

The committee report was signed by Gardiner Pattison, Pattison & Bowns; Thomas Dickson, Dickson & Eddy, and Eliot Farley, D., L. & W. Coal Co., representing the anthracite operators; Roderick Stephens, Stephens Fuel Co.; Hiram Blauvelt, Comfort Coal & Lumber Co., and Mr. Turner, representing the National Retail Coal Merchants' Association; Charles A. Owen, Imperial Coal Corporation, and H. N. Taylor, U. S. Distributing Corporation, representing the National Coal Association; G. N. Snider, Dickson & Eddy; Seth W. Morton, Morton Coal Co. and G. M. Dexter, Dexter-Carpenter Coal Co., representing the American Wholesale Coal Association, and F. R. Wadleigh, Walter H. Wilson and V. G. Lowe, members at large. Mr. Stephens was chairman of the committee.

## Convict Mining Abolished

The Flat Top mines of the Sloss-Sheffield Steel & Iron Co., Flattop, Ala., with 540 convicts, and the Aldrich mine of the Montevallo Coal Mining Co., with 340 convicts, on July 1 went on a basis of free labor exclusively, in accord with an enactment at the last session of the Legislature prohibiting the employment of convicts in coal mines. For some time these men have



Richard F. Grant

Long associated with the Hanna interests, of Cleveland, Ohio, Mr. Grant has resigned from the presidency of the Susquehanna Collieries Co. to head the recently merged Lehigh Valley Coal Co. and the Lehigh Valley Coal Sales Co., the new concern being known as the Lehigh Valley Coal Corporation.

not been leased to the operating companies but have been working in mines leased by the state from coal operators. The convicts removed from the mines will be employed on roads, on state farms and in state cotton mills.

The Montevallo Coal Mining Co. is erecting 50 homes and two bath houses for its new employees in addition to the 100 already there. The Sloss-Sheffield company is completing the town of Alden with 160 new homes. In addition there are 100 old homes at Flat Top. Flat Top and Aldrich were the last two mines working state convicts. There is plenty of free labor available.

## Mine Blast Kills Five

Five miners were killed and seven others were seriously injured as the result of an explosion June 20 in the National mine of the National Fuel Co., near Morgantown, W. Va. The blast occurred just before the night shift was due to leave the workings. Twenty-two men were in the mine at the time, of whom ten escaped with slight injuries. The mine is a drift operation which employs about 100 men when operating at normal capacity.

## Railroads Reach Compromise On Lake Cargo Rates

Fresh complications were added to the lake-cargo rate embroglio early this month when executives of the interested Northern and Southern carriers at a meeting in New York, July 6, reached an understanding that they would endeavor to secure approval of a compromise which would give the Pittsburgh field a differential of 35c. over Southern base rates on coal to the lake ports for transshipment. This is the same compromise suggested and rejected at Cincinnati, Ohio, May 3.

In the meantime Northern carriers who did not join in the first filing of tariffs making a reduction of 20c. in rates to meet the cut from the Southern fields which was outlawed by the Interstate Commerce Commission but made effective under a federal injunction have put in schedules making the differential 45c. This is the differential contemplated in the second decision of the Commission in the lake-cargo case. The rates of the New York Central and Pennsylvania became effective June 18; those of the Baltimore & Ohio and Western Maryland on June 28; those of the Pittsburgh & West Virginia and lines for which F. V. Davis is agent on June 29.

## Three New Cleaning Plants For Pittsburgh Coal Co.

The Pittsburgh Coal Co. has inquiries out for 1,100 tons of steel to complete its new coal-washing plants at Champion, on the Montour R.R. between Imperial and McDonald, and at Douglas, Pa., on the Youghiogheny River. The Rheolaveur process will be used, as announced in *Coal Age* last December. The company is expending \$1,700,000 on these improvements.

The company already is operating an air cleaning plant at Library. A fourth plant, the Banning, is to be installed at Jacobs Creek. The four plants will have an annual capacity of 6,500,000 tons of clean coal. These plants will serve 10 mines.

The preparation plant at Champion will be a combined tippie and coal-washing plant, serving five mines, and will operate 20 hours a day, with a four-hour intermission for clearing and adjusting. There will be eight tracks under the plant. It is being equipped to clean 650 tons an hour, or 13,000 tons a day.

The plant at Douglas will serve the Warden mine but will produce coal for metallurgical use and for byproduct coking. This plant will handle 300 tons an hour.



## Lewis Calls Policy Committee Meeting To Consider Illinois Situation

**M**EETINGS of the international executive board and the policy committee of the United Mine Workers to be held July 10 and 11, respectively, at Indianapolis, Ind., were called by John L. Lewis, international president of the miners' union, on July 3. The call was issued "for the purpose of reviewing the strike situation in various bituminous coal fields."

The meeting of the policy committee had been requested by Harry Fishwick, president of the Illinois district, where the miners are seeking the right to negotiate separate agreements with operators. It was expected that the Illinois miners would present their request to the two meetings.

In addition to reviewing the strike situation the announcement from international headquarters said proposed federal legislation dealing with the bituminous coal industry would be considered.

The executive board of the Illinois union met in St. Louis recently in order to consider the labor situation in the state. Thousands of idle miners were said to be on the verge of rebelling against the rule of John L. Lewis, international president. Harry Fishwick, state president, is quoted as saying: "It is our belief that if we can be free to negotiate separately with the operators' association both the union and the operators may gain ground over the present condition and contribute to a revival of the industry in Illinois. This does not, in any sense, however, carry a threat to cut adrift from the United Mine Workers. It simply is based on the belief that the policy of the international union, adopted more than a year ago at the Indianapolis convention, does not meet conditions which exist today in Illinois."

**A**GREEMENTS with the union to pay the Jacksonville scale were signed during June by the Nason Coal Co., operating the Nason mine, which normally employs 1,000 men; the Black Star Coal Co., owning the Logan mine, at Logan, employing 300 men; the Pana Coal Co.'s mine No. 1, at Pana, and the Golden Rule Coal & Mining Co., which operates the Golden Rule mine, at Lenzburg, employing about 110 men.

Illinois and Indiana operators have been advertising extensively in local newspapers throughout the state as a means of informing the miners and the public of the necessity for a modification of the Jacksonville wage agreement. The Peabody Coal Co. points out that it has only seven mines working in the state—none of them full time—while fourteen are idle. "We have offered and are willing to pay at our mines in Illinois wages and rates higher than those paid generally in the mines which now have the business that Illinois mines formerly had," says one of the advertisements.

The O'Gara Coal Co. states that in 1917 it mined 2,974,957 tons; in 1927 the output was 1,126,447 tons, a decrease of 1,848,510 tons, due to the arbitrary attitude of the union officials.

The May report of the Illinois department of mines and minerals showed 105 mines producing coal. Production totaled 2,685,737 tons. The mines worked an average of 13.9 days and employed 29,779 miners. There are approximately 400 mines and 80,000 miners in Illinois. The May figures indicate that nearly 300 mines are closed and at least 50,000 miners are idle.

Production in May, 1927, when practically all of the mines were idle because of the suspension of mining in the union bituminous coal fields, totaled 215,089 tons. In December, 1927, there were a total of 186 mines operating, producing 6,209,347 tons, working an average of 17.5 days.

A "Workers' Committee" has distributed the following pamphlet in the Clinton, Ind., coal fields: "Will we work or continue to starve? We have tried the famous Jacksonville agreement—and failed. There are sixteen mines in the Clinton coal field, and only one working part time. A few years ago these same mines shipped 500 cars per day. Think of it! Today, only 15 cars are being shipped daily. We once loaded it here and we can load it again—under the 1917 wage scale. What other union would permit its members to

suffer misery, want, poverty and loss of homes before it would modify a working agreement? If the union don't, we will. Other districts that have pulled away, and gone for themselves, on the 1917 wage scale, are now prospering. These are facts. Why wait? Let us meet with the operators in the Clinton field and make a workable agreement to save Clinton and this community."

### Frick Reduces Wages

Notice of an 11 per cent cut in the wage scale for virtually all classes of employees except pit coal diggers was posted on June 30 by the H. C. Frick Coke Co., the first wage change by this company in many years. It is estimated the cut affects 35,000 men in Fayette and Westmoreland counties, Pennsylvania. The company has been paying approximately the Jacksonville scale, although it is non-union.

Under the new schedule machine miners' wages are cut 10 per cent, but the pit digging scale remains unchanged. Drivers, cagers, blasters, track layers and timbermen will receive \$6 for an eight-hour day; assistant timbermen and track layers, \$5.25; outside day laborers, \$3.60; mine laborers, \$5.50; leveling coke ovens, 26c. each, and drawing ovens, 19c.

Net earnings of the United Electric Coal Cos. for the nine months ended April 30 were \$637,163, equal to \$4.20 per share on the common stock. This compares with \$521,700, or \$3.37 per share, in the corresponding period of a year ago.

## What the Two Big Party Platforms Say About Coal and Labor

### Republican

**Mining.**—The money value of the mineral products of the country is second only to agriculture. We lead the countries of the world in the production of coal, iron, copper and silver. The nation suffers as a whole from any disturbance in the securing of any one of these minerals, and particularly when the coal supply is affected. The mining industry has always been self-sustaining, but we believe that the government should make every effort to aid the industry by removing any restrictions which may be hampering its development, and by increased technical and economic research investigations which are necessary for its welfare and normal development. The party is anxious, hopeful and willing to assist in any feasible plan for the stabilization of the coal mining industry which will work with justice to the miners, consumers and producers.

**Labor.**—The party favors freedom in wage contracts, the right of collective bargaining by free and responsible agents of their own choosing, which develop and maintain that purposeful co-operation which gains its chief incentive through voluntary agreement. We believe that injunctions in labor disputes have in some instances been abused and have given rise to a serious question for legislation.

The Republican Party pledges itself to continue its efforts to maintain this present standard of living and high wage scale.

### Democratic

**Coal.**—Bituminous coal is not only the common base of manufacture, but is a vital agency in our interstate transportation. The demoralization of this industry, its labor conflicts and distress, its waste of a national resource and disordered public service, demand constructive legislation that will allow capital and labor a fair share of prosperity with adequate protection to the consuming public.

**Labor.**—(a) We favor the principle of collective bargaining and the Democratic principle that organized labor should choose its own representatives without coercion or interference.

(b) Labor is not a commodity. Human rights must be safeguarded. Labor should be exempt from the operation of anti-trust laws.

(c) We recognize that legislative and other investigations have shown the existence of grave abuse in the issuance of injunctions in labor disputes.

Injunctions should not be granted in labor disputes except upon proof of threatened irreparable injury, and after notice and hearing; and the injunction should be confined to those which do directly threaten irreparable injury.

The expressed purpose of representatives of capital, labor and the bar to devise a plan for the elimination of the present evils with respect to injunctions must be supported and legislation designed to accomplish these ends formulated and passed.

(d) We favor legislation providing that products of convict labor shipped from one State to another shall be subject to laws of the latter State as though they had been produced therein.

## Safety, Stripping and Power Cost Engage Illinois Institute

**S**AFETY, stripping operations and power costs took up a major portion of the proceedings of the Illinois Mining Institute on its annual boat trip on the "Cape Girardeau." The party left St. Louis, Mo., on June 21, and the first stop was made at Cape Girardeau, Mo. After a short sightseeing trip, President James S. Anderson called the meeting to order and introduced Dr. Leighton, of the Geological Survey of Illinois, who gave an interesting description of the geological formation of southern Illinois.

James Powell, superintendent, Superior Coal Co., Gillespie, Ill., then delivered a paper on "The Relation of First-Aid Training to Accidents." In his paper Mr. Powell called attention to the tendency of mine managers to gloss over the cost of accidents. He also stated that "in 1927 the Superior Coal Co. operated four mines and a coal washery in Illinois, employing a total of 3,200 men, and produced 2,005,176 tons of coal without a fatal accident." The accident records showed that employees holding first-aid certificates were seldom injured, and plans were laid for 100 per cent training.

Classes were started at all the mines and in the neighboring towns with the co-operation of U. S. Bureau of Mines and Illinois Department of Mines and Minerals representatives, as well as state and county inspectors. Not only did the miners receive training but other people from all walks of life were instructed by Superior Coal Co. employees. Men and boys trained numbered 3,389, and 495 women and girls received instruction in first aid.

The officials of the Superior Coal Co. found that their production per lost-time accident was 43,388 tons, or 13,250 tons over the average for the state. A decrease of 26 per cent in accident cost was observed during the first three months of 1928 from the preceding three months in 1927.

**A**T THE afternoon session on Friday, June 22, Joseph D. Zook, vice-president and general manager of the O'Gara Coal Co., Chicago, presided as chairman and made some appropriate remarks on mining problems and their influence on cost reduction. W. D. Ryan, Kansas City, Mo., a representative of the U. S. Bureau of Mines, was introduced and gave an interesting talk on accident prevention, asserting that 75 per cent of all accidents were avoidable.

"Modern Stripping Methods" was the title of a paper presented by Joseph E. Hitt, president, Northern Illinois Coal Corporation, Chicago. Following the reading of his paper Mr. Hitt gave a motion picture display. The evening session was prefaced by a shore trip at Cairo, Ill., and the next stop was made at Cape Girardeau, Saturday morning.

Harvey E. Smith, past president of the Institute, reviewed the progress of the Institute since his term of office at

the opening of the Saturday morning session. The chairman then introduced David Jones, chief electrical engineer, Valier Coal Co., Valier, Ill., who gave a paper on "Recent Developments in Mining Devices." Mr. Jones described, among other things, the switching and block signal devices in use in the mines of his company, as well as wire and timber trains, a hoisting plan to reduce demand power charges, the relative merits of limestone and shale dust for rock-dusting, a road-cleaning machine and improved shop equipment.

Mine roadways at the Valier operation are cleaned by a loading machine which pulls an empty car behind it. The gathering end sets down between the rails and on each side of the track, and as the machine proceeds the loose material is gathered up and conveyed to the empty car. The machine cannot be used on switches or on curved track. The material in these areas is shoveled out by hand, the refuse being thrown back to where the loader can reach it.

**T**HE wire train replaces the regular day force and is operated at night. This train is made up of three cars, one car carrying a spool of trolley wire and a spool of feeder wire. Another carries a tool box and a bin for reclaimed materials. The third car is closed and equipped with bins for the necessary supplies. Carrying the material with the train eliminates wastage, and Mr. Jones said a large amount of unused material was picked up during the first week the train was operated.

A timber train also will be put in use and will be equipped with an air compressor, jacks for raising bars, air drills, electric drills, an electric saw and a device for boring 9-in. holes for setting crossbars without legs.

Mr. Jones also described an interesting device for eliminating maximum power demand charges based on a five-minute peak load. "In order to prevent an increase in our maximum demand," he said, "we control the use of power with our main electric hoist. There is practically no fluctuation in the power used by our main hoist. The large fluctuation in power used at our mines is caused by haulage motors and cutting machines, which may all be operating at one time. We have a graphic demand meter, synchronized with the meter of the power company, located in front of the hoisting engineer, as well as a five-minute clock which shows seconds on the dial and the beginning and end of each five minutes.

"The hoisting engineer starts the hoist at the beginning of a five-minute period and runs the hoist to capacity for perhaps two minutes, all the time watching the speed of the graphic demand meter. If the power is being used too fast as he nears the end of a five-minute period he can slow down

his hoist. By controlling our power within predetermined limits we never increase our maximum demand.

"Toward the end of a five-minute period there may be ten or fifteen cars on the bottom to be hoisted. If they were hoisted within the five-minute period it probably would cause the power consumption to exceed the limit. If the limit is very nearly approached before the five-minute period is up we stop the hoist entirely and start it again on the next five-minute speed.

"At the end of the day we have lost no time in hoisting, as we can speed up the hoist at the time the cutting machines and motors are idle. We find that our greatest power consumption is from 11 a. m. until 2 p. m."

**T**HE afternoon session was presided over by C. J. Sandoe, general manager of the West Virginia Coal Co., St. Louis, Mo. At this meeting Harry Treadwell, chief operating engineer, Chicago, Wilmington & Franklin Coal Co., Benton, Ill., presented a paper entitled "Ventilation Problems in Connection with New Mining Methods." In the evening, John A. Garcia, of the Allen & Garcia Co., Chicago, described his recent trip to Russia.

Mr. Treadwell stated in his paper that loading machines, entry drivers and larger pit cars were taking up most of the room in entries nowadays and were making the construction of lead curtains for ventilating purposes difficult. The curtains are being replaced by auxiliary fans and ventilating tubing which should be placed in accordance with the following rules:

(1) The booster fan should be placed on the intake entry with no open crosscuts outby and at least 10 ft. outby the open crosscut.

(2) The amount of air passing should be at least twice the capacity of the fan.

(3) The tubing should be suspended with hooks from a wire secured to wooden pegs in the roof.

(4) The parallel entry should be ventilated with a "Y" in the ventilation tube and the same fan used or another unit should be set by the first.

(5) The quantity of air put to the face should be enough to supply the men and dilute the gas to the proper percentage. An excessive quantity will bring large quantities of coal dust into the return air, resulting in a dangerous condition upon its settling out.

(6) The length of the ventilating tubing should be determined by the efficiency of the fan engaged in circulating the necessary amount of air at the face.

Among other things of interest, Mr. Treadwell stated that getting more air to the face or cutting the cost of ventilation usually would require cleaning up of airways and removal of obstructions. Maintenance of a few airways gives better results than the use of a number of entries which are choked with slate, and does not require speeding up of the fan.



## Retailers Condemn Watson Bill; Conference Plan Approved

CONDEMNATION of the Watson coal bill, approval of the Coal Industry Conference and support of a proposal to change the date of the coal year from April 1 to May 1 were voiced at the eleventh annual convention of the National Retail Coal Merchants' Association at the New Ocean House, Swampscott, Mass., June 18-20. The retailers also registered objection to the practice of some wholesalers and operators sending out postcard quotations. The present practice of the anthracite companies in making only two advances after the announcement of spring schedules was commended.

In the smaller towns, read a resolution on this subject, "the information thus becomes current gossip to the embarrassment of the local dealer, who must then explain all the intricacies of freight, degradation, haulage, overhead and general costs of doing business in order to justify his fair local coal prices."

The Watson bill (S. 4490), declared Roderick Stephens, chairman of the association's committee on government regulations, is a direct menace to the future of the retailer. The Stephens report paid special attention to that section of the bill reading:

The Commission shall further inquire as to the preparation of applicants for maintaining and their ability to maintain direct selling agencies in their principal consuming markets and shall provide reasonable regulations requiring the maintenance of such agencies of direct sale to the consumer.

"Stripped of its legal verbiage," said Mr. Stephens, "this section of the law is designed to eliminate the coal retailer from the principal markets consuming bituminous coal. I want everyone to remember the last words of the section quoted. It uses the word 'requiring.' It does not leave it to the discretion of the operator as to whether he may choose to sell direct to the consumer or not; it requires or compels him to do so under the direction of the Commission."

"We as retailers are again referred to on page 7, line 17, of the bill, which reads as follows:

Said Commission shall study and encourage the economical distribution of markets between said licensees and the development of joint or co-operative selling agencies, yards and docks which said licensees may desire to use.

"If words have any significance, these words require the creation of a vertical trust to permit the bituminous operator to control distribution to the final consumer."

The co-operative advertising campaign undertaken by a majority of the anthracite producers was characterized as "perhaps the biggest thing that has happened in the coal industry for a great many years," by Hiram Blauvelt, chairman of the standing committee on advertising. C. A. Connell, Anthracite Coal Service, described the work of that organization and urged retailers to be

the aggressors in promoting the sale of anthracite and in meeting statements made on behalf of competitive fuels.

C. B. Huntress, National Coal Association, the next speaker, called the attention of his audience to the fact that on the tonnage basis more bituminous coal was consumed in household heating than anthracite and that the use of soft coal in the city of Washington was increasing while that of hard coal was decreasing. The latter part of his address was devoted to a "close-up" of the recent Senatorial committee hearings on coal.

"Merchandising of Domestic Coal" was the theme of the address of H. A. Glover, vice-president, Knox Consolidated Coal Co., who was the first speaker at the Tuesday morning session. Merchandising, he declared, is the weakest link in coal production and distribution at the present time. Unless there is an abandonment of hit-or-miss methods, "the larger units among the producers will undoubtedly either own



M. E. Robinson, Jr.

outright and operate their own retail companies or, through interlocking ownership, control their policy.

"To apply modern merchandising methods to domestic coal, we must eliminate the mad scramble of the operator to sell his coal to the retailer and the independent effort of the dealer to resell it to the ultimate consumer. In other words, we must shorten the chain of distribution. This dual operation is wasteful, uneconomic, inefficient and, in my opinion, unsound merchandising. We must shorten the chain of distribution to one sale—from the mine to the ultimate consumer. The dealer has been the means of separating producer and ultimate consumer; he should be the point of contact between them."

Careful selection of retail outlets, trade-marked coals, proper advertising, exclusive agencies serviced by adequate merchandising plans were advocated.

AS PRODUCERS we have a direct responsibility to the retailer to see that he gets clean fuel and that it is well-sized fuel. I am one of those who feel that the producer will not have fully discharged his responsibility until he comes as close to giving as nearly perfectly sized and perfectly prepared coal as it is humanly possible to do the job.

I am not here to argue as to the percentage of slate with which the coal should be diluted or to sell the idea that the burden of ash removal and disposition can be handled in any better way than by the producers' exerting themselves within the scope of their own activities to give you clean, well-sized coal against which there can be no question mark so far as the requirements of the public are concerned.—  
A. J. Maloney, at Swampscott, June 20, 1928.

Mr. Glover illustrated his argument with a number of sales letters to consumers which his company had sent out for retail distributors. He urged careful analysis of markets and prospects by the retailers.

An optimistic view of the future of anthracite was taken by Richard F. Grant, recently chosen to head the consolidation of Lehigh Valley operating and sales interests. Most of the losses in recent years had been due to zoning, strikes and mild weather. But a vigorous attack had been made upon remediable causes and progress could be reported. The new sizing was praised.

Harry Turner reported on the National Coal Week program and how that idea had been subordinated to the broader plan of the Coal Industry Conference to represent all branches of the industry, the equipment men and the railroads in a campaign to broaden the markets for coal. The report of the special committee of fifteen suggesting such a Conference and asking each association to name delegates to an organization meeting was approved.

D. F. Williams, vice-president in charge of sales, Hudson Coal Co., stressed the point that many complaints against the quality of the coal put in the householder's cellar really can be traced to faulty equipment. Out of 3,000 cases serviced, he said, only one-half of one per cent could be charged to inferior coal. He also attacked the use of foreign fuel by New England markets, making a plea of American goods for Americans.

Following the election of officers and directors and the revision of bylaws at the opening of the Wednesday session, Daniel T. Pierce, vice-chairman of the Anthracite Operators' Conference, again voiced his abiding faith in advertising. The first principle, he said, was a good product well merchandised and well serviced. Advertising bred confidence in seller as well as buyer and the anthracite industry is now out in the open

telling its story to the public—vigorously and unafraid.

Co-operation, remarked A. J. Maloney, president, Philadelphia & Reading Coal & Iron Co., simply means "playing the game." The problem facing the coal industry is that of getting back to normalcy after wartime upsets and inflation. While conditions from the standpoint of inflation somewhat paralleled those in agriculture the situation was not as bad in coal. Today "we must meet the job of merchandising as distinguished from simple distribution." That means co-operation between producer and distributor.

Mr. Maloney scouted the idea of the entrance of the producer into the retail field. "The production of anthracite," he said, "is a separate branch of the industry, entirely apart from the ultimate distribution to the householder. If the producer attempts to do the job all the way through to the ultimate consumer, he is, in my opinion, bound to fail at one end of the business, either as a distributor or as a producer."

R. C. Rowan, service engineer, Consolidation Coal Co., the final speaker, gave an illustrated talk on the combustion problems of the industrial consumer.

M. E. Robinson, Jr., vice-president, M. E. Robinson Coal Co., Chicago, was elected president of the association. Hiram A. Blauvelt, vice-president, Comfort Coal & Lumber Co., Hackensack, N. J., was elected first vice-president, and John Rheinfrank, New York, treasurer. W. A. Clark, Boston, Mass.; George T. Kinney, Kansas City, Mo.; George W. Malcolmsom, Detroit, Mich.; John J. O'Connor, Milwaukee, Wis., and Charles B. Staats, Albany, N. Y., were elected vice-presidents.

### Wakenva Coal Bond Issue Has Unusual Feature

The Wakenva Coal Co., Inc., operating 30 mines in Virginia, West Virginia, Kentucky and Tennessee, placed on the market June 27 at par through M. W. Bradermann Co., Inc., an issue of \$400,000 6½ per cent convertible collateral trust sinking fund gold bonds, due Aug. 1, 1947.

An unusual feature of this financing is that payment of the principal is assured by the deposit with and assignment to the trustee of an endowment policy of the New York Life Insurance Co. on the life of the president of the Wakenva company, having all premiums paid in advance to maturity. The policy is unconditionally payable at maturity.

### Dawson Mine Reopens

Operations were resumed July 5 at the Dawson mine of the Consolidation Coal Co., located about three miles from Clarksburg, W. Va. The mine had been closed down since May 31. The plant will operate for an indefinite period with about 300 men employed. In 1926 the Dawson mine ranked as the largest producing mine between Fairmont and Clarksburg.

## \$200,000,000 Coal Merger Making Progress

Representatives of some of the largest coal producers in southern West Virginia and Virginia met at the Waldorf-Astoria, New York City, on June 20 for a general discussion of the proposed \$200,000,000 merger of coal properties in those states. The companies affected by the proposed consolidation have an annual output of 35,000,000 tons. While no authoritative statement was made following the meeting some of the conferees expressed satisfaction at the progress made.

This was the sixth meeting held since negotiations began about six months ago. Other conferences are expected to be held before the plans are fully worked out.

Isaac T. Mann, president, Pocahontas Fuel Co., chairman of the executive committee, presided at the meeting, and Holly Stover was secretary. Other members of the executive committee are R. H. Knode, president, General Coal Co.; T. B. Davis, president, Pond Creek Pocahontas Co.; W. P. Tams, Jr., president, Gulf Smokeless Coal Co.; R. H. Gross, president, New River Co.; R. C. Hill, chairman of the board, Consolidation Coal Co., and W. C. Atwater, president, American Coal Co. of Alleghany County.

Stockholders of three coal companies met the last week in June and voted to accept the terms of the proposed merger. The companies holding meetings were the Yukon Pocahontas Coal Co. and the Buchanan Coal Co., both located on the Dry Fork branch of the Norfolk & Western Ry., and the Greenbrier Coal & Coke Co., McDowell County.

These are among the first companies involved to take definite action on the merger plan. The Yukon Pocahontas company has an annual output of about 400,000 tons and the Greenbrier company has been producing about 200,000 annually. The Yukon and Buchanan stockholders met in Tazewell and the meeting of the Greenbrier stockholders was held at Bramwell.

Isaac T. Mann, one of the leading stockholders of the Greenbrier company, attended the meeting of the Greenbrier company.

### Industrial Coal Consumption Steady; Stocks Decline

Bituminous coal stocks in industries in the United States on June 1 showed a further decline of 2,640,000 tons from the preceding month. Total stocks of both anthracite and bituminous coal in the United States and Canada were slightly less than 41,000,000 tons at the beginning of last month.

Consumption stayed about the same, totaling slightly less than 35,000,000 tons. At that rate the supply of coal on hand would last 36 days. On June 1 of last year the country had on hand 54 days' supply of coal, total stocks being 65,500,000 tons. Consumption as of June 1 last year was 8½ per cent greater than this year. Two years ago

total stocks on hand were 36,000,000 tons, or 10 per cent lower than at the present time. The supply measured in days was 31. Thus present stocks are within 10 per cent, or 4,000,000 tons, of a normal year and consumption is running about the same as in 1926.

#### DAYS' SUPPLY OF COAL ON HAND IN VARIOUS INDUSTRIES

Byproduct coke.....	19
Electric utilities and coal-gas plants.....	66
Railroads.....	36
Steel mills.....	39
Other industries.....	35
Average of total stocks throughout the country.....	36

#### ESTIMATES OF OUTPUT, CONSUMPTION AND STOCKS

	U.S. Output	Industrial Consumption	On Hand in Industries
July.....	38,697,000	33,560,000	62,585,000
August.....	48,907,000	33,900,000	59,697,000
September.....	48,592,000	33,195,000	59,179,000
October.....	51,400,000	35,813,000	60,154,000
November.....	47,100,000	35,514,000	57,940,000
December.....	47,309,000	37,225,000	55,725,000
January.....	49,645,000	37,678,000	52,909,000
February.....	46,933,000	36,301,000	50,595,000
March.....	49,452,000	38,588,000	48,388,000
April.....	39,081,000	35,230,000	37,432,000
May.....	44,748,000	34,844,000	43,670,000
June 1.....			40,890,000

Bituminous coal stocks held by railroads of the country on June 1 showed a decrease of 527,502 tons from the reserves held a fortnight earlier, according to reports made to the American Railway Association. Total stocks held by the carriers on June 1 were 12,073,815 tons, consisting of 2,828,803 tons on cars and 9,245,012 in ground storage. On May 15 they had 2,865,350 tons on cars and 9,735,967 tons on the ground.

### Ohio Mine Opens at \$5 Scale

Operation was resumed at the No. 4 mine of the Rail & River Coal Co., at Stewart, north of Powhatan, Ohio, late in June. The mine is said to be giving employment to about 250 men, many of whom are former employees who have been on strike and out of work since April 1, 1927. The company resumed operations under a non-union policy, paying a wage scale based on a maximum day wage of \$5. It is understood that at least three other large mines in the eastern Ohio field are to resume operations in the near future.

### Bruceton Blast Kills One

Officials of the U. S. Bureau of Mines are investigating an explosion that occurred July 2 in an experimental laboratory at the Bureau station at Bruceton, Pa. Three employees were injured, one fatally. Murray Riggs died in the Marine Hospital from burns, and Paul Guest and Robert Kennedy were injured, though their condition is not considered serious.

### Blockton No. 10 Leased

No. 10 Blocton Mine of the Tennessee Coal, Iron & Railroad Co., a slope opening in the Woodstock Seam in Bibb County, is reported to have been leased for a long term of years by W. I. Young, of West Blocton, and William Evans, who have placed the mine in operation.



## McGraw-Hill and Shaw Companies Are Consolidated

A consolidation affecting two large publishing interests was brought about June 29 by the merger of the McGraw-Hill Publishing Co., Inc., New York City, and the A. W. Shaw Company, Chicago.

The Shaw organization publishes *The Magazine of Business, System and Industrial Distributor and Salesman*, while the McGraw-Hill organization is the publisher, either directly or through subsidiary and affiliated companies, of over twenty leading business papers, and of engineering and business books. Its magazines cover the electrical, mechanical, construction, mining and chemical fields, and include *Coal Age*, *Electrical World*, *Engineering News-Record*, *Power*, *American Machinist*, *Engineering & Mining Journal*, *Chemical & Metallurgical Engineering* and *Radio Retailing*. The two companies have had a close relationship since last fall when they jointly formed the McGraw-Shaw Company, which publishes *Factory and Industrial Management* and *Industrial Engineering*.

A. W. Shaw will continue as chairman of the board and James H. McGraw will become president of the A. W. Shaw Co. Mr. Shaw also will become a director of the McGraw-Hill Publishing Co., Inc., and will continue as president of the McGraw-Shaw Co. Mr. Wheeler Sammons will become a director and member of the executive committee of the McGraw-Hill Publishing Co. and senior vice-president and general manager of the A. W. Shaw division of the business, which will be known as the "A. W. Shaw Co., a division of the McGraw-Hill Publishing Co., Inc." The McGraw-Shaw Co. also will be operated as a division of the McGraw-Hill Publishing Co.

Two reasons for the merger are stressed by the officers of the merging companies. The magazines of the two organizations are complementary in character. The Shaw papers cover business broadly, giving the business man an understanding of what is going on in all branches of trade, industry and finance. Their service is extensive in character. The McGraw-Hill service, on the other hand, is intensive. Its magazines give a highly specialized service to given major industries and to related industrial groups. Thus the consolidated companies serve the business man in both his general and special business interests. The second reason is the very evident economy and increased effectiveness of consolidated operation, enabling a superior service to be rendered to the whole sweep of American business.

Mr. Shaw made this comment on the consolidation:

"It is gratifying to me after long years spent in developing the Shaw publications to have them put together with the strong group developed under Mr. McGraw's leadership. The com-

bination will strengthen both groups. *The Magazine of Business and System* cover broadly the problems of all business, and exchange knowledge between its different divisions. The McGraw-Hill papers specialize on the problems of a dozen or more major branches of industry and trade. The advantages of joint control of these related but differing publications is apparent.

"The merger comes at a particularly gratifying time, when the Shaw organization, following a plan long contemplated, is re-establishing *System*, which was the pioneer general business paper. For more than 25 years it was the guide, philosopher and friend of tens of thousands of men conducting the smaller businesses of this country and the administrative work of the larger ones. To this well-discharged task it now returns—and fortunately at a time when the McGraw-Hill and Shaw merger enables a maximum of energy to be put back of the inspiring task of re-establishment."

Mr. McGraw gave the following reasons for the merger:

"Mr. Shaw's organization and ours have been working closely together for more than a year, and have seen the benefits of consolidated effort between groups having widely different publishing experiences. The Shaw company has had a signal success in publishing magazines of large circulation and of broad appeal to the industrial and business worlds. The McGraw-Hill company has intensively served by specialized publications, the leading engineering industries and the trade channels for distributing their products.

"It was apparent that the McGraw-Hill group of industrial and trade papers would have a new way of carrying the message of common business problems if it was allied with papers like *The Magazine of Business and System*. At the same time these publications would be immeasurably strengthened by being tied in with and assisted by the great editorial staff of over one hundred and thirty industrial and business specialists who edit the McGraw-Hill papers. There also were conspicuous opportunities for more effective subscription and advertising work and for economies in every phase of publishing.

"The logic of these opportunities could not be escaped. The merger has been the result.

"Though every paper of the merging companies will be strengthened by the consolidation, and thus render greater service to its readers and advertisers, the most conspicuous result will be the new and strong position of *The Magazine of Business*. Through Mr. Shaw's vision and courage it is a magazine of strength, standing and influence. It now becomes the capstone of the virile group of papers and the other publishing activities of the McGraw-Hill company, thus extending the scope of the latter

organization to the whole range of American business. At the same time, drawing on the intimate contact with trade and industry of the large corps of McGraw-Hill specialist editors, it will speak with unexampled authority on the problems of business. It will be able to render an outstanding service to the business men of America by its authoritative information, its expert interpretation, and its fearless advocacy of sound business policies. It will fight for the interests of business but it will place in an equally important position the responsibility of business to the public. It will, in a word, stand for true business statesmanship."

### Committee on Engineering Standards Named Anew

In order to get more co-operation with trade associations which "fight shy" of engineering and believe it concerns only engineers, and in order to avoid the awkward and unanswerable question, "Committee! Committee of What?" the Main Committee of the American Engineering Standards Committee has approved a change of name to the American Standards Association and the change is being submitted to the members for approval. The technical work of approving standards will rest with a standards council, and the administrative and financial responsibility with a board of directors composed of twelve industrial leaders.

Only engineering standards will be formulated, but it seemed best not to so indicate in the title because it might be thought that executives and trade associations were not interested but only engineers. Furthermore, if it was felt that the engineers were organizing and controlling it—as the old name seemed to indicate—they might be expected to support it. As they are not the financial directors of their companies, their monetary support could not be expected to be adequate to finance so large and important a project, which is, after all, of value not so much to them as it is to those who profit by investment in the industrial enterprises thus benefited.

### Union Pacific Veterans Get Together

Twelve men's first aid and mine rescue teams, as well as fourteen Boy and Girl Scout first-aid teams, with their banners and rescue apparatus, lent youth, life and color to the parade featuring the fourth annual celebration of the Union Pacific Coal Co. Old Timers' Association, held at Rock Springs, Wyo., June 9. The reunion followed a first-aid meet held the previous day and featured the fellowship of employees with service records over twenty years.

Eugene McAuliffe, president of the Union Pacific company, and other officials attended the reunion. A business meeting and the parade were followed by a banquet at which W. B. Wilson, former Secretary of Labor, was the principal speaker, and a theater party in the

evening. The veteran mine men in the employ of the Union Pacific company were honored in several addresses and in the consideration shown them by the citizens of Rock Springs. The oldest employee in the point of service was James Moon, who started with the company 54 years ago. Many members who attended had over twenty years of faithful employment behind them.

### D. A Thomas Buys Company

Possession of the Montevallo Straven Coal Co., which has operated a 300- to 400-ton mine at Straven, Ala., passed on July 1 to D. A. Thomas, president of the Montevallo Coal Mining Co. He has formed the Straven Coal Mining Co. to operate the new acquisition.

The purchase was made June 21 in bankruptcy proceedings. Mr. Thomas is planning improvements which will increase the capacity to 600 tons. The coal bed is 72 in. thick and lies on a 12-deg. pitch. Operation will be under supervision of the Montevallo mine officials residing at Aldrich, which is twelve miles from Straven.

### New Company Buys Plant

The Merrimac Coal Co., recently organized with Columbus (Ohio) capitalists principally interested, has acquired the plant, tenements and properties of the White Star Mining Co. at Merrimac, about five miles from Williamson, W. Va. The new company will continue the operation of the plant along practically the same lines as the sellers. The Merrimac company has capital stock of 1,000 shares of no par value and was incorporated by J. E. Browder, M. C. Gilchrist, R. C. Paxton, I. F. Somerville and G. S. Adams.

### Improve Whipple Mine

Improvements costing around \$200,000 will soon be completed at the Whipple mine of the New River Co., Whipple, W. Va. The shaft has been enlarged and a new type of mine car is to be used that will double the capacity of the mine. A working force of 450 men can be accommodated under the new system. About 20 new tenement houses and a new club house for foreign labor were completed recently.

### Plan New Tipple

Tentative plans are being made by the Sharon Coal & Coke Co., operating at Sharondale, W. Va., about five miles from Williamson, to build a steel tipple to take the place on the wooden one destroyed by fire on June 2.

### Resumes at Capacity

The Black Diamond Coal Co., which operates near Atlantic, in Preston County, W. Va., resumed operations at capacity on July 1 after having been idle for several months. Isaac Conn is superintendent of the mine.

## Fifty Foreign Savants to Attend Coal Parley

Announcement has been made of the persons who will participate at the Second International Conference on Bituminous Coal, Nov. 19-24, at Carnegie Institute of Technology, Pittsburgh, Pa. Great Britain will send W. A. Bone, Dr. C. H. Lander, R. Lessing, Sir Alfred Mond, Harold Nielsen, F. S. Sinnatt and others. Twelve will come from France, including Jean Bing, who came last year; sixteen from Germany, including Franz Fischer and Dr. Bergius; three from Belgium, two from Italy, Japan and Russia respectively, and one each from Austria, Czechoslovakia, Denmark, Canada, Norway, Poland and Spain.

### British Coal Men Honored

Five men prominent in the British coal industry were among those included in the King's birthday honors list. The Right Honorable Sir Alfred M. Mond, chairman of the Amalgamated Anthracite Collieries, Ltd., and president of the Institute of Fuel, was created a baron. Henry Walker, Chief Inspector of Mines, was made a knight. Prof. John S. Haldane, director of the mining research laboratory of Birmingham University, was made a companion of honor. Cecil H. Lander, director of fuel research under the Department of Scientific and Industrial Research, was created a Companion of the British Empire. John Masterton, Divisional Inspector of Mines for Scotland, received the Order of the British Empire.

### Will Strip Mine Ingle Tract

The New York Electric Shovel Co., which recently purchased the property of the Ingle Coal Co. in Pike County, Indiana, has surveyed a railroad and now has a force of men at work on the grade connecting the switch of the Aryshire Coal Co. with the switch of the Enos Coal Co., which connects the Evansville & Indianapolis R.R. just south of Oakland City. The Arthur No. 8 mine is being remodeled for stripping operations.

### Merger Option Extended

Several months ago the West Virginia Southern Coal Co., in which Eastern capitalists are largely interested and of which W. H. Cunningham, of Huntington, is president, obtained an option on the properties of the Cabin Creek Consolidated Coal Co., the option expiring on July 1. It has been extended to Sept. 15, however, it is learned through E. B. Needham. The understanding is that there are seven mines involved in the option.

### New Washery at Belle Ellen

The Bessemer Coal, Iron & Land Co. is building a new washery at its Belle Ellen Mine, in Bibb County.

## Personal Notes

JAMES PRENDERGAST, executive sales manager of the Susquehanna Collieries Co., anthracite operations of the M. A. Hanna Co., has been made president, succeeding Richard F. Grant, who resigned to become head of the Lehigh Valley Coal Corporation, a merger of the Lehigh Valley Coal Co. with the Lehigh Valley Coal Sales Co.

JOHN R. LAWSON, leader of the United Mine Workers in the 1914 coal strike, in Colorado, has been appointed assistant to Merle D. Vincent, president of the Rocky Mountain Fuel Co., Denver, Colo. Mr. Lawson will also become a member of the board of directors.

P. C. THOMAS has severed his connection with the New River & Pocahontas Coal Co. to become identified with the Koppers interests at Pittsburgh. Mr. Thomas was located for several years at Helen and later at Fayetteville, W. Va.

HENRY PFENING, JR., vice-president, Blue Diamond Coal Co., Middlesboro, Ky., and J. B. Torbert, president, Harlan-Wallins Coal Corporation, Pineville, Ky., have been appointed to the executive board of the Harlan County Coal Operators' Association.

WALTER C. TEAGLE, president, Standard Oil Co. of New Jersey, has been elected a director of the Consolidation Coal Co.

JOSEPH P. JENNINGS, who retired June 1 from the employ of the Pennsylvania Coal Co. and the Hillside Coal & Iron Co. after 35 years' service, was guest of honor at a testimonial banquet June 16 at the Hotel Casey, Scranton, Pa. The affair was given by his former fellow employees and was attended by more than 375 persons. A. K. Morris, vice-president and general manager, in behalf of the company and employees, presented Mr. Jennings with a new model Franklin sedan.

THE DEGREE of Doctor of Engineering was conferred on Howard N. Eavenson by the University of Pittsburgh at the commencement held June 13.

J. W. POWELL, mining engineer, of Welch, W. Va., sailed from New York June 14 on the str. *Thuringia* for Moscow, where he will remain a short time and then proceed to Kemerova, Siberia. Here he will resume his duties with the Kuzbas enterprise, which operates three groups of coal mines in the Kuznetz basin, in southwestern Siberia. He has been connected with these interests as consulting engineer since 1924.

CONRAD WELSCH, recently promoted to outside superintendent of the Riverside colliery of the Scranton Coal Co., was entertained at a banquet given by employees of the company June 16 at the Hotel Jermyn, Scranton, Pa. Mr. Welsch has been connected with the Scranton Coal Co. in various capacities for the last 30 years. At the time of his promotion he was outside superintendent of the Pine Brook colliery.



## Engineers Discuss Mining Problems Of Nova Scotia

A STATEMENT of the position of the coal trade in eastern Canada and papers on underground support of roadways, installation of underground electrical machinery, endless haulage, long-wall mining, and the mining of gold, gypsum and diatomaceous earths featured the thirty-sixth annual meeting of the Mining Society of Nova Scotia, held at Halifax June 19 and 20. Col. Walter Herd, chief mining engineer, British Empire Steel Corporation, was elected president to succeed F. W. Gray. J. J. McDougall and H. M. Wylde were elected vice-president and second vice-president respectively.

In his presidential address Mr. Gray gave a detailed restatement of the position of the coal trade in eastern Canada. He declared that in "recent years the use of other energy sources has lessened coal consumption, the per capita consumption of coal in Canada being now one-third of a ton less than it was fifteen years ago. The use of petroleum, natural gas, and hydro-electric energy are largely responsible for the checking of coal consumption. From a national standpoint, however, water power in Canada is not to be considered as a competitor with coal but as an additional and fortunately available source of energy wherewith Canada's poverty in coal resources may be supplemented.

"Recent advances in commercial utilization consist in the transformation of solid coal into power, oil, and gas—all efforts to obtain rapid and complete combustion. While the perfection of combustion methods remains yet to be accomplished, the sources of combustibles will remain substantially the same. Bituminous coal is the most certain and largest source of energy available.

"There are two aspects of the future of coal usage and consequently of coal demand: (1) The viewpoint of our day, which sees the consumption of coal conserved by the use of petroleum, natural gas and water power, and by economies in the utilization of coal itself arising out of improved combustion methods; (2) the viewpoint of a later day, which may not be that of this generation, when coal will have become in effect the sole source of commercially available energy outside of hydro-electricity."

THE problem of Canadian coal supply, Mr. Gray continued, is one difficult of solution. The coal reserves of Canada are so situated that the greater part of New Brunswick and all of Quebec, Ontario and Manitoba are without seams. This includes a well settled and wealthy region, furnished with a number of railroad and water transportation systems where the poverty of coal resources is a serious economic problem.

"From an economic standpoint," said

Mr. Gray, "Canada cannot progress without assistance in coal supply from the United States. From the national standpoint Nova Scotia's coal contribution is necessary to political independence, which is merely one way of saying that the Nova Scotia collieries must be maintained in a healthy and productive condition. The practical compromise between economic and national standpoints is to avoid entire dependence upon the United States' coal supply and to maintain the Canadian coal fields in a healthy productive condition." Mr. Gray develops this thought in the following paragraphs:

"Ten per cent of the value of Canada's annual mineral production and half the coal mined in Canada is produced in Nova Scotia by 1 per cent of Canadian population, making the Nova Scotia coal field of irreplaceable national value. Upon its productivity rests—to a degree that if fully developed would lay one open to exaggeration—the maintenance of Canadian nationality.

"WITH regard to the extent of reserve of unmined coal in Nova Scotia it is not one of practical import to this generation. The true reserve will be decided by the cost of recovery balanced against the selling price obtainable, which in its turn will hinge upon the extent to which capital can be invested in coal production in Nova Scotia when balanced against the probability of capital return, and interest that might possibly be earned on the investment. The problem which more especially concerns the industry at this time is the maintenance of existing production capacity."

Mr. Gray then discussed the market situation of the Nova Scotia coals and stated that "The marketing problem of Nova Scotia is essentially a question of transportation, but of seasonably interrupted transportation, the quality of coal or suitability for special use being secondary to transportation costs." Full utilization of the St. Lawrence waterway and an outlet for winter mined coal are to be afforded by the government. This action is of importance as it will permit the testing out of the two fundamental necessities of the Nova Scotia coal producers.

In addition, it was stated that "no consideration of the economic features of Nova Scotia coal mining can ignore that the cost of production is almost twice what it was twelve years ago." However, a "most hopefully significant development is that coal is now being mined in distant submarine territory at a cost of production as cheap or cheaper than in land areas having comparable physical conditions, an achievement made possible by employment of swift electrical haulages and the use of mechanical cutting and loading devices at the working face of the coal seam,

### *P. & R. to Dye Its Coal Bright Purple*

Purple is the newest tint in coal. The Philadelphia & Reading Coal & Iron Co. is carrying on experiments at the Otto Colliery, Branchdale, Pa., with plans to give its anthracite output a bright purple hue that will make it distinctive.

Late last winter the Glen Alden Coal Co. inaugurated a similar scheme when it sent out a large portion of its product dyed a bright blue, which caused it to be known in some localities as "peacock coal."

permitting maximum concentration of operation."

The removal of carbon-sulphur compounds from coal gas by benzol washing was the theme introduced by the next speaker, Kenneth L. Dawson, superintendent, Nova Scotia Tramways Co., Halifax, Nova Scotia. Gold mining matters concerning Nova Scotia were considered at the afternoon session.

The Leonard medal for a paper on the gold measures of Nova Scotia was presented to Sir Stopford Brunton by Col. G. S. Harrington, Minister of Mines, at the annual dinner. It also was announced that the retiring president, F. W. Gray, had been awarded the Barlow memorial prize for his paper, "The Undersea Mining of Coal."

Papers on the mining of gypsum and diatomaceous earth in Nova Scotia were discussed in the morning session on June 20. These were followed by a paper on the "Care and Installation of Underground Electrical Machinery," by E. L. Marteleur, electrical engineer, British Empire Steel Corporation, and another by Louis Frost, mining engineering department, Dominion Coal Co., on "The Use of Steel Arches in Supporting Underground Roadways."

THE use of steel for roof support affords an opportunity to reduce costs, said Mr. Frost, and he added that steel, "while showing the highest safety efficiency, is also highly flexible and is applicable to practically all conditions where timber is employed, whether in the support of the roof at the coal face or in the support of roadways in the mine operating on the longwall system, and is also applicable to longwall mining in steep seams."

In the support of mine roadways, the aim is not to resist the pressure due to the overlying strata but to regulate the pressure to such a degree that the settled area conforms with the requirements for ventilation and transportation.

"When timber is used to regulate this pressure either wholly or partly, as lags to support straight booms, the final area is a minimum, due to the deflection of roof, sides and floor. If, on the other hand, steel supports are employed in the form of the 'horseshoe'

or 'semi-horseshoe' arch or closed arch, reinforced with either brick or concrete between the webs, the final area is a maximum, owing to the shape reacting uniformly against the physical action of the roof, sides and floor. The arches gradually take the shape of the roadway, and, in spite of distortion where heavy pressures are encountered, continue to support the roof and sides indefinitely."

**T**HE life of a timbered roadway is comparatively short in unsettled ground, and the "maintenance of a wholly or partly timbered road is a source of expense from the time a mine roadway is driven until its abandonment. With steel arching, on the other hand, the first cost is the only cost to be considered. Once erected, steel arching maintains a road for an indefinite number of years, there being no maintenance cost due to failure of the arches.

"Steel arching is at its best when supporting weak roofs and where side pressures are encountered. If efficiently lagged between the girder and the strata, no overriding of the arch can take place. While the employment of steel arches as a means of support shows the greatest utility in longwall mining, they may also be economically employed in the support of main airways in pillar mining, where the roof is tender and the side of a friable nature, and especially in the roadways forming the main returns for the ventilating current."

An economic feature of decided importance in the employment of steel arches "is the fact that they can be withdrawn from abandoned roadways and reset over and over again, their life being practically unlimited.

"Where they are so bent and twisted that they cannot be reset they are sent to the surface to be straightened and they can, in a suitable press, be readily restored to their original shape, the structural weakening of the steel being infinitesimal. When only slightly twisted, they are straightened cold, but when badly twisted they are treated in the hot state."

### Firm 75 Years in Business

The Stephens Fuel Co., New York City, is celebrating its 75th anniversary this year. The business was established by James Stephens and is now run by the second and third generations of the founder. Olin J. Stephens, son of the founder, is president of the company, which is one of the best-known retail concerns in the country.

### Named Hudson Distributor

Geo. C. Foedisch & Co., Philadelphia, Pa., has been appointed, effective July 1, as wholesale distributor of the Hudson Coal Co.'s anthracite for the States of Pennsylvania, southern New Jersey, Delaware, Maryland, Virginia and points further south.



New Castle Team, Winner White Men's First-Aid Contest

Left to right: Byram Faucette, Clarence Faucette, W. H. McKinney, Fred Faucette, Lathey Bolden and "Buster" Bolden.

### 44 First-Aid Teams Compete In Alabama Meet

Forty-four teams took part in the tenth Alabama first-aid contest held in the municipal auditorium at Birmingham, Ala., June 23. Ladies' teams, boy scout teams and colored miners' teams participated.

First prize for white miners went to a team of the New Castle Coal Co., captained by Byram Faucett. The second and third prizes were captured by teams of the DeBardeleben Coal Corporation, as follows: Sipsey team, captained by Alfred M. Julian, second; Empire team, captained by Hardy Davis, third.

A negro team also from Sipsey mine was awarded first prize in its class. Second went to the Empire colored team and third to a team from Acmar mine of the Alabama Fuel & Iron Co.

The women's contest was won by a team from New Castle mine, captained by Berta Kirkpatrick. Second went to a team from Sipsey mine, captained by Carrie E. Walker.

First prizes to men's teams consisted of fountain pens and \$5 gold pieces to each member. Fountain pens were given to members of teams winning seconds. Ladies' prizes were the same excepting compacts were given in place of pens.

The Alabama Council of the Holmes Safety Association awarded a \$25 cash prize to Harry Brown, of the Virginia mine, Gulf States Steel Co., for the best letter of suggestions for decreasing accidents from falls of roof or coal.

Sponsors of the first-aid contest were the Alabama Mining Institute, U. S. Bureau of Mines, American Red Cross and the state inspection department.

The suggestions submitted by Harry Brown as the most effective means of reducing accidents from falls of roof and coal, which captured the \$25 prize offered by the Alabama Council, Holmes Safety Association, are as follows:

- (1) Strict state laws and their enforcement.
  - (2) Strict mine rules and good discipline.
  - (3) Systematic timbering, and spragging of roof and coal. Rules on how to set timbers (or props).
- A printed sketch showing how timbers are set, in proper position.

A printed sketch, showing the danger of improper timbering.

Special—To set more timbers, when roof conditions are more unfavorable.

Special—All coal undermined, or undercut, to be spragged, as per rules adopted, and in all hand pick mining, sprags to be set before undermining is started.

(4) (a) Close inspection of all working places and roadways, by mine foreman and foreman assistants, not to be over two hours' intermission, with date and time recorded with chalk, in all working places.

(b) Not to leave any working place, after locating any danger, until same is same safe or properly marked "danger," so as to avoid accident.

(5) All persons employed to be supplied with a copy of the state mine laws and mine rules at least 24 hours before going on duty.

(6) Some competent person should be employed to examine each person employed as to his knowledge of his duties, the laws and rules of mines.

(7) Persons examined and not passing the examination satisfactorily should be sent back to learn more of their duties until they can pass with satisfaction.

(8) Any person, or persons, who are the cause of an accident through neglect of duty should be turned over to the state mine inspector for court trial.

(9) Make a heavy fine the penalty for any disobedience of laws or rules.

(10) Honor, encourage, promote, where possible, for obedience, cleanliness, good suggestions and safety.

### Form Indiana Trade Body

The Indiana Coal Trade Association has just been organized with headquarters at 400 Opera House Block, Terre Haute, Ind. R. J. Smith, president, Princeton Mining Co., and R. C. Woody, vice-president, Electric Shovel Coal Corporation, were elected chairman and vice-chairman, respectively, of the executive committee. Jonas Waffle is executive secretary of the new organization. This association will take over the work formerly conducted by the traffic department of the Indiana Bituminous Coal Operators' Association, of which Mr. Waffle was traffic manager. The latter organization was dissolved June 30.

### Coming Meetings

Institute of Chemistry of the American Chemical Society. Second session, July 23 to Aug. 18, at Evanston, Ill.

Anthracite Educational Exposition, Willow Grove Park, Philadelphia, Pa., auspices Anthracite Boosters' Association, Aug. 4-11.

International First-Aid and Mine Rescue Meet, Butte, Mont., Aug. 20-22.

Rocky Mountain Coal Mining Institute. Summer meeting, Rock Springs, Wyo., Aug. 27-29.

American Society of Mechanical Engineers. Summer meeting, St. Paul and Minneapolis, Minn., Aug. 27-30.

American Institute of Mining and Metallurgical Engineers. Fall meeting in Boston, Mass., Aug. 29-31, under auspices of Boston section. After the meeting there will be an excursion to Newfoundland, starting Sept. 1 or 2, covering about two weeks.

New York State Coal Merchants' Association. Annual convention, Sept. 13-15, at Saranac Inn, Upper Saranac, N. Y.

Second National Fuels Meeting, under the auspices of the Fuels Division of the American Society of Mechanical Engineers, Sept. 17-20, at Cleveland, Ohio.

Second International Conference on Bituminous Coal, Carnegie Institute of Technology, Pittsburgh, Pa., during week of Nov. 19.

Coal Mining Institute of America. Annual meeting Dec. 12, 13 and 14, at Pittsburgh, Pa.



# Coal-Mine Fatality Rate High in May Due to Major Disasters

Accidents in the coal-mining industry of the United States in May, 1928, resulted in the death of 373 men, according to information received from state mine inspectors by the U. S. Bureau of Mines. Of this number 323 deaths occurred in bituminous coal mines; the remaining 50 were in the anthracite mines of Pennsylvania. The death rate per million tons of coal mined during the month was 8.34, based on a production of 44,748,000 tons, as compared with 4.29 for May, 1927, based on an output of 43,397,000 tons and 186 deaths. The unusually high rate for May, 1928, was due to 230 deaths in four explosions.

The rate for May, 1928, for bituminous coal alone, based on a production of 36,624,000 tons and 323 fatalities, was 8.82 per million tons, which also is much above normal. The rate for anthracite mines, with a production of 8,124,000 tons and 50 fatalities, was 6.15 per million tons. In May, 1927, the fatality rate for bituminous mines was 3.76; that for anthracite was 6.62; and for the industry as a whole it was 4.29.

During the first five months of 1928 accidents at coal mines caused the loss of 988 lives. The production of coal for this period was 230,128,000 tons, showing a death rate of 4.29 per million tons as against 3.85 for the same five months of 1927, based on 1,053 deaths and 273,642,000 tons. The record for bituminous coal alone from January to May, 1928, was 797 fatalities and 198,326,000 tons,

with a fatality rate of 4.02; while that for anthracite showed 191 deaths, 31,802,000 tons and a death rate of 6.01. The same period for 1927 showed 829 deaths in bituminous mines, 240,002,000 tons, with a rate per million tons of 3.45; that for anthracite showed 224 deaths, 33,640,000 tons, and a death rate of 6.66; for both bituminous and anthracite 1,053 deaths were reported, with a production of 273,642,000 tons and a fatality rate of 3.85.

Four explosions in which five or more lives were lost—occurred during May, 1928. One at Mather, Pa., on May 19 killed 195 men. On May 22 an explosion at Harlan, Ky., caused the death of 8 men and another at Yukon, W. Va., on May 22 killed 17 men. An explosion at an anthracite mine at Parsons, Pa., on May 25, killed 10 men. These four accidents bring the number of major disasters to 8 with a resulting loss of 284 lives during the first five months of 1928 as compared with 7 for the same period of 1927 with 140 deaths.

Comparison of the accident record from January to May, 1928, with that for the same period of 1927 follows:

	Year 1927	Jan.- May, 1927	Jan.- May, 1928
All causes.....	3,704	3,848	4,293
Falls of roof and coal.....	1,907	1,791	1,777
Haulage.....	0.586	0.632	0.552
Gas or dust explosions:			
Local explosions.....	0.153	0.161	0.100
Major explosions.....	0.258	0.464	1.234
Explosives.....	0.183	0.179	0.148
Electricity.....	0.167	0.150	0.135
Other causes.....	0.450	0.471	0.347

## Urges Law for Rock Dust And Closed Lights

Heavy loss of life from gas explosions caused by the use of open lamps in supposedly non-gaseous mines in West Virginia has resulted in the decision of the State Department of Mines, of which R. M. Lambie is chief, to ask the next session of the Legislature to amend existing law in four respects:

(1) An amendment will be introduced to empower the department to compel the rock-dusting of mines when in the discretion of the chief that appears to be the best way of avoiding a menace. Under existing law, the operation has the option of rock-dusting, "wetting down" or using some other method of laying dust.

(2) The Legislature will be asked to make it compulsory to eliminate the open lamp and use instead a modern, approved electric lamp.

(3) It will be urged that the law be so amended that it will be compulsory for each miner to carry on his person while at work a "self-rescuer."

(4) Provision will be asked for at least three expert electrical inspectors and to compel all electrical equipment placed or replaced in the mines to be approved.

It is pointed out that within the last three months seventeen men have been killed by gas explosions in supposedly non-gaseous mines.

## Coal-Mine Fatalities During May, 1928, by Causes and States

(Compiled by Bureau of Mines and published by Coal Age)

State	Underground											Shaft				Surface							Total by States			
	Falls of roof (coal, rock, etc.)	Falls of face or pillar coal	Mine cars and locomotives.	Explosions of gas or coal dust.	Explosives.	Suffocation from mine gases.	Electricity.	Animals.	Mining machines.	Mine fires (burned, suffocated, etc.).	Other causes.	Total.	Falling down shafts or slopes.	Objects falling down shafts or slopes.	Cage, skip or bucket.	Other causes.	Total.	Mine cars and mine locomotives	Electricity.	Machinery.	Boiler explosions or bursting steam pipes	Railway cars and locomotives.	Other causes.	Total.	1928	1927
Alabama.....	2		4		1		2					9													9	6
Alaska.....																									0	0
Arkansas.....																									0	1
Colorado.....	1	2										3													3	8
Illinois.....	2											2													2	4
Indiana.....												1													1	0
Iowa.....																									0	1
Kansas.....																									0	0
Kentucky.....	5			8			1					14													14	15
Maryland.....			1									1													1	0
Michigan.....	1		1									2													2	0
Missouri.....					1							1													1	0
Montana.....																									0	1
New Mexico.....																									0	0
North Dakota.....																									0	1
Ohio.....	1		1						2			4													4	5
Oklahoma.....	2											3													3	2
Pennsylvania (bituminous).....	12	3	7	195		1			2			219		1			1						1	1	221	25
South Dakota.....																									0	0
Tennessee.....			4									4													4	0
Texas.....																									0	0
Utah.....																									0	3
Virginia.....												1													0	9
Washington.....	1																								1	2
West Virginia.....	18	3	4	17			4		1			47				1	1						1	2	50	50
Wyoming.....	1	1	1									3													3	1
Total (bituminous).....	49	9	23	220	2	1	8		5			317		1		1	2	1	1				2	4	323	133
Pennsylvania (anthracite).....	19	4	6	13	1		3				3	49			1										50	53
Total, May, 1928.....	68	13	29	233	3	1	11		5		3	366		1	1	1	3	1	1				2	4	373	
Total, May, 1927.....	82	13	26	25	3	1	11		2		7	180						2	1				3	6		186

# Current Prices of Mining Supplies

## SINCE LAST MONTH

**PIPE** and wire products continue in the upward trend noted throughout June. Cast-iron pipe is up \$1 per ton at mills and principal f.o.b. points. Bare copper wire advanced 0.5c. per lb., at Chicago, during the month. Stiff increases occurred in mill quotations on locomotive cable at the principal producing centers. The only classification to show actual weakness is that of iron and steel scrap. The latter declined about 25c. per ton during the last month in direct contrast with the steady advances in non-ferrous metal scrap.

**STEEL RAILS**—The following quotations are per gross ton, f.o.b., in large mill lots:

	Pittsburgh	Birmingham	Chicago
Standard Bessemer rails.....	\$43.00	\$43.00	\$43.00
Standard open-hearth rails.....	43.00	43.00	43.00
Light rails, 25 to 45 lb.....	36.00	34@36	36@38

**TRACK SUPPLIES**—The following prices are base per 100 lb. f.o.b. Pittsburgh mill for large mill lots, together with warehouse prices at Chicago and Birmingham:

	Pittsburgh	Chicago	Birmingham
Standard spikes, 1/4-in. and larger.....	\$2.80	\$3.55	\$3.00
Track bolts.....	3.80	4.55	3.90
Standard section angle bars, splice bars or fishplates.....	2.75	3.40	3.00

**WROUGHT STEEL PIPE**—On deliveries from warehouses at the places named the following discounts hold for welded steel pipe:

	New York	Chicago	St. Louis
to 3 in. butt welded.....	50%	54%	49%
2 1/2 to 6 in. lap welded.....	45%	51%	46%

	New York	Chicago	St. Louis
1 to 3 in. butt welded.....	36%	41%	36%
2 1/2 to 6 in. lap welded.....	32%	38%	33%

## WROUGHT-STEEL PIPE LIST

Size, Inches	List Price per Foot	Diameter in Inches External	Diameter in Inches Internal	Thickness Inches
1	\$0.17	1.315	1.049	.133
1 1/2	.23	1.66	1.38	.14
1 3/4	.27 1/2	1.9	1.61	.145
2	.37	2.375	2.067	.154
2 1/2	.58 1/2	2.875	2.469	.203
3	.76 1/2	3.5	3.068	.216
3 1/2	.92	4.0	3.548	.226
4	1.09	4.5	4.026	.237
4 1/2	1.27	5.0	4.506	.247
5	1.48	5.563	5.047	.258
6	1.92	6.625	6.065	.28

**CAST-IRON PIPE**—Prices, f.o.b., per net ton, for Class B in large mill lots:

	Birmingham	Burlington, N. J.	New York
4 in.....	\$36.00	\$40.00	\$42.60
6 in. and over.....	33.00	37.00	39.60

	Pittsburgh	Chicago	St. Louis	San Francisco
4 in.....	\$44.50	\$44.20@45.20	\$41.60	\$46.00
6 in. and over.....	41.50	41.20@42.20	38.60	43.00

Gas pipe and Class "A," \$3.00 per ton extra.

**BOLTS AND NUTS**—Discounts from list, Apr. 1, 1927, on immediate deliveries from warehouse in New York and vicinity: Machine bolts, square heads and nuts, up to 1x30-in., full packages, 50%; Carriage bolts up to 1/2 x 6-in., full packages, 55%; Nuts, hot-pressed or cold-punched, blank or tapped, square or hexagonal, full packages, 55%.

**STEEL PLATES**—Following are base prices per 100 lb. in large mill lots, f.o.b., for 1-in. thick and heavier:

Pittsburgh.....	\$1.85	Birmingham.....	\$2.05
-----------------	--------	-----------------	--------

**STRUCTURAL RIVETS**—The following quotations are per 100 lb., in mill lots, f.o.b. mill, for 1-in.:

Pittsburgh.....	\$2.90	Cleveland.....	\$2.90	Chicago.....	\$3.00
-----------------	--------	----------------	--------	--------------	--------

**WIRE ROPE**—Discounts from list price on regular grades of bright and galvanized, in New York and territory east of Missouri River:

	Per Cent
Plow steel round strand rope.....	35
Special steel round strand rope.....	30
Cast steel round strand rope.....	20
Round strand iron and iron tiller.....	5
Galvanized steel rigging and guy rope.....	7 1/2
Galvanized iron rigging and guy rope (add to list).....	12 1/2

**RAIL BONDS**—Stranded copper, 28-in., 4/0, B. & S. gage, are welded, at points east of the Mississippi, price per 100 net..... \$93.18

**DRILL ROD**—Discounts from list at warehouse:

New York.....	60%	Cleveland.....	55%	Chicago.....	50%
---------------	-----	----------------	-----	--------------	-----

**FRICTION TAPE**—Size 1/4-in. in 100 lb. lots in Eastern territory, per lb., \$0.29

**RAILWAY TIES**—For fair-sized orders, f.o.b., the following prices per tie hold:

	6 In. x 8 In. by 8 Ft.	7 In. x 9 In. by 8 1/2 Ft.
Chicago, white oak, heart, untreated.....	\$1.40	\$1.78
Chicago, oak, empty cell creosoted.....	1.80	2.40
Chicago, oak, zinc treated.....	1.60	2.10
Chicago, Southern pine, creosoted.....	1.60	2.10
St. Louis, white oak, untreated.....	1.20	1.80
St. Louis, red oak, creosoted.....	1.50	2.30
St. Louis, sap pine or cypress, untreated.....	1.00	1.60
Birmingham, Southern pine, untreated.....	1.10	1.25
Birmingham, Southern pine, creosoted.....	1.60	1.75

**STEEL MINE TIES**—Prices range from \$0.38 to \$0.60 per tie, f.o.b. Pennsylvania and West Virginia districts, depending on quantity, gage of track and weight of rail.

**CALCIUM CARBIDE**—In drums, round lots in New York market, per lb., \$0.05@0.06.

**BRATTICE CLOTH**—Prices f.o.b. cars New York, Philadelphia, St. Louis or Chicago, per sq. yd.:

Jute, 24-oz., double warp.....	\$0.19	Jute, waterproof.....	\$0.22
Jute, 22-oz., single warp.....	.17	Duck, waterproof.....	.33
Jute, 18-oz., single warp.....	.15	Duck, non-inflammable.....	.32

**COTTON WASTE**—The following prices are in cents per lb. for bale lots:

	New York	Cleveland	Chicago
White.....	10.00@13.50	16.00	15.00
Colored.....	9.00@13.00	12.00	12.00

**MACHINE OIL**—Medium bodied, in 55 gal. metal barrels, per gal., as follows:

New York.....	\$0.30	Cleveland.....	\$0.36	Chicago.....	\$0.36
---------------	--------	----------------	--------	--------------	--------

**SCRAP IRON AND STEEL**—The prices following are f.o.b. per ton paid by dealers:

	New York Per Gross Ton	Chicago Per Gross Ton	Birmingham Per Gross Ton
No. 1 railroad wrought.....	\$9.50@10.00	\$12.50@13.00	\$11.00@11.50
Stove plate.....	8.50@ 9.00	13.00@ 13.50	9.00@ 9.50
No. 1 machinery cast.....	12.50@ 14.00	15.00@ 15.50	12.50@ 14.00
Machine shop turnings.....	6.00@ 6.50	6.75@ 7.25	7.00@ 7.25
Cast borings.....	6.00@ 6.50	9.00@ 9.50	7.25@ 7.50
Railroad malleable.....	10.00	12.50@ 13.00	10.25@ 10.75
Re-rolling rails.....	10.00@ 10.50	14.25@ 14.75	10.25@ 10.75
Re-laying rails.....	23.00@ 24.00		23.00@ 24.00
Heavy melting steel.....	9.50@ 9.85	12.50@ 13.00	

**SCRAP COPPER AND BRASS**—Dealers' purchasing prices in cents per lb.:

	New York	Cleveland	Chicago
Crucible copper.....	13.00 @ 13.25	12.00	11.75@ 12.25
Copper, heavy, and wire.....	12.75 @ 12.87 1/2	11.25	11.25@ 11.75
Copper, light, and bottoms.....	10.75 @ 11.25	9.75	10.00@ 10.50
Brass, heavy, yellow.....	7.50 @ 7.75	7.75	7.25@ 7.75
Brass, heavy, red.....	10.00 @ 10.50	10.00	9.50@ 9.75
Brass, light.....	6.25 @ 7.25	6.25	6.25@ 6.75
No. 1 yellow rod turnings.....	7.75 @ 8.25	7.75	7.50@ 8.00

**COPPER WIRE**—Prices of bare wire, base, at warehouse, in cents per lb. are as follows:

New York.....	20.12 1/2	Cleveland.....	19.62 1/2	Chicago (mill)	16.75
---------------	-----------	----------------	-----------	----------------	-------

**TROLLEY WIRE**—In carload lots, f.o.b., producing point, all sizes, per lb.:

Round.....	\$0.1662 1/2	Grooved.....	\$0.1687 1/2	Fig. 8.....	\$0.173 1/2
------------	--------------	--------------	--------------	-------------	-------------

**TROLLEY WHEELS**—Price f.o.b. Jersey City, N. J., each:

4-in.....	\$1.00	5-in.....	\$1.40	6-in.....	\$1.70
-----------	--------	-----------	--------	-----------	--------

**MINING MACHINE CABLE**—F.o.b. producing point, net, per M. ft.:

No. 2 Duplex Flat, Braided		Two Conductor, Round Rubber Sheathed	
Size 2-133.....	\$182.00	Size 2-133.....	\$669.00
Size 3-133.....	162.00	Size 3-133.....	579.00
Size 4-133.....	143.00	Size 4-49.....	470.00

**LOCOMOTIVE CABLE**—F.o.b. producing point, single conductor, braided, net, on reels containing 1,500 ft., per M. ft.:

Size 3.....	\$89.60	Size 4.....	\$66.30
-------------	---------	-------------	---------

**FEEDER CABLE**—Price per M. ft. in larger buying centers east of the Mississippi River:

B. & S. Size	Two Conductor	Three Conductor
No. 14 solid.....	\$30.00 (net)	\$44.00 (net)
No. 12 solid.....	136.00	180.00
No. 10 solid.....	185.00	235.00
No. 8 stranded.....	305.00	375.00
No. 6 stranded.....	440.00	530.00

From the above lists discounts are: Less than coil lots, 50%; Coils to 1,000 ft., 60%; 1,000 to 5,000 ft., 65%; 5,000 ft. and over, 67%.

**EXPLOSIVES**—F.o.b. in carload lots:

Black Powder	West Virginia	Districts	Missouri
FF, NaNo3 base,		Pennsylvania	
800 kegs per car, per 25 lb. keg.....	\$1.70@1.80	\$1.70	\$1.75
Ammonium permissible			
1 1/2 x 8 in. sticks,			
20,000 lb. per car, per 100 lb.....	14.00@15.00	13.75	14.00



# Among the Manufacturers



THE BETHLEHEM STEEL Co. has taken over the sales and promotion of Keystone narrow-gage metal ties, hitherto handled by the Keystone Metal Tie Corporation.

\* \* \*

BOTFIELD REFRACTORIES Co., Philadelphia, Pa., announces that the distribution of its products in Toledo, Ohio, and vicinity is now being handled by the Builders' & Industrial Supply Co., 4090 Detroit Street, Toledo.

\* \* \*

THE CHICAGO SALES OFFICE of the Joseph Dixon Crucible Co. is now located at 2003 Builders' Building, Wacker Drive and LaSalle St.

\* \* \*

CHICAGO PNEUMATIC TOOL Co. announces the appointment of Geo. J. Lynch as district manager of sales at 1931 Washington Ave., St. Louis, Mo. Mr. Lynch was formerly assistant district manager in the New York office.

\* \* \*

THE WAGNER ELECTRIC CORPORATION, St. Louis, Mo., announces the removal of its New York City branch sales office from 50 Church St. to Suite 1110, 30 Church St. C. P. Potter, engineer in charge of large motor and transformer divisions, has been elected chairman of the St. Louis Section of the American Institute of Electrical Engineers.

\* \* \*

THE LINCOLN ELECTRIC Co. announces these changes and additions: H. A. Stamper has been placed in charge of consumer motor sales in the New York district. D. F. Titus is now in charge of welder service in the New York district. A. H. Kirkpatrick replaces D. W. Carver as manager of welder service in the Cincinnati district. Mr. Carver has been transferred to the Cleveland district. H. E. Nelson has taken charge of consumer motor sales in the Cincinnati district. P. A. Ludwig has assumed charge of welder service in Philadelphia and vicinity. Forrest Kessler has been transferred from the welding time study department at the factory to welder service division in the Cleveland district. J. R. Rothermel is in charge of welder service at Chicago and W. Weaver has been placed in charge of consumer motor sales in the same district.

F. C. ALLEN, JR., founder and former president of Allen & Billmyre Co., Inc., recently severed his connections with that organization. He is now president of Allen Air Appliance Co., Inc., making his headquarters at the New York office of this company, in the Grand Central Terminal Building. The main office and plant is at Glens Falls, N. Y.

\* \* \*

JAMES CLEARY has been appointed general sales manager of Combustion Engineering Corporation.

\* \* \*

THE WAGNER ELECTRIC CORPORATION, St. Louis, Mo., announces that E. D. Pike, heretofore in charge of Pacific Coast service operation, has been made manager of the San Francisco branch sales office.

\* \* \*

CURTIN-HOWE CORPORATION, wood-preservation engineers, 11 Park Place, New York City, announce the appointment of Kenneth M. Bailey as technical sales representative with offices at 515 New Orleans Bank Building, New Orleans, La.

\* \* \*

C. O. BARTLETT & SNOW Co., Cleveland, Ohio, announces the appointment of J. R. Allison to the staff of its Pittsburgh office at 406 Bessemer Bldg.

\* \* \*

ROLLER-SMITH Co., 233 Broadway, New York City, announces that its sales in the state of Texas are now being handled by John A. Coleman, 1006 Washington Ave., Houston; Colorado, Utah, Wyoming and northern New Mexico business is being handled by H. T. Weeks, U. S. National Bank Bldg., Denver, Colo.

\* \* \*

AN AMERICAN CORPORATION has been formed to manufacture to American standards the "Isothermos" journal box, with automatic lubrication system, now in use on more than thirty European, African and South American railroads. It also has been adapted to mine cars, street railways, etc. The American company is known as the Isothermos Corporation of America and has its permanent executive offices at 11 West 42d St., New York City. The officers and directors are: Hubert E. Rogers, president; A. De Bac, vice-president; Dr. F. H. Hirschland, treasurer; F. O. Willhoffer, secretary, and Spier Whitaker.

CONSOLIDATION of Casey-Hedges and Walsh & Weidner has been effected under the name of Hedges-Walsh-Weidner Co. with headquarters at Chattanooga, Tenn.

\* \* \*

THE TRICO FUSE MFG. Co., Milwaukee, Wis., announces the removal of its Pittsburgh (Pa.) office to new and larger quarters at 405 Penn Ave.

\* \* \*

FRANCIS A. EMMONS, sales and advertising manager of Foote Bros. Gear & Machine Co., Chicago, was elected president of the Engineering Advertisers Association of Chicago at the annual meeting of the association held at the Palmer House, June 4.

\* \* \*

KENNETH GRANT, formerly of the Machinists Supply Co., Chicago, recently joined the sales organization of the Foote Bros. Gear & Machine Co. He will cover territory in southern Wisconsin, northern Illinois and eastern Iowa.

\* \* \*

MOORHEAD-REITMEYER Co., Inc., Pittsburgh, Pa., has moved its office and shop from 40 Water St. to larger quarters at 57 Water St.

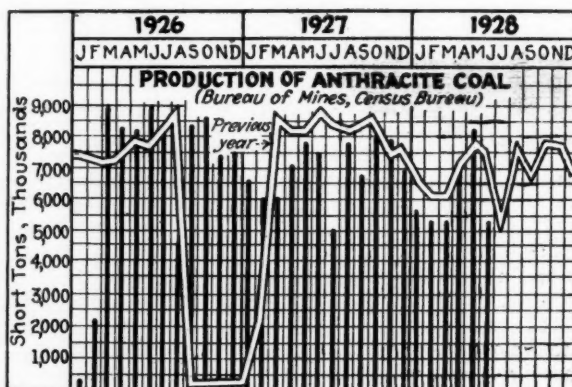
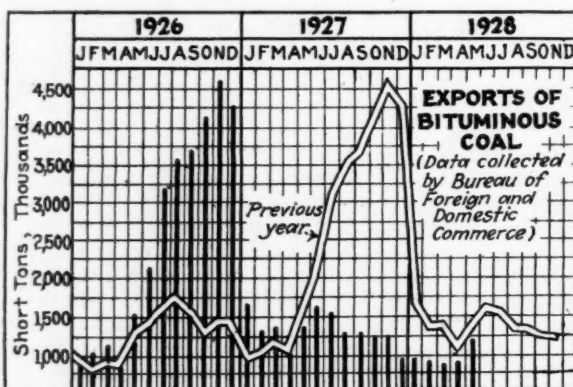
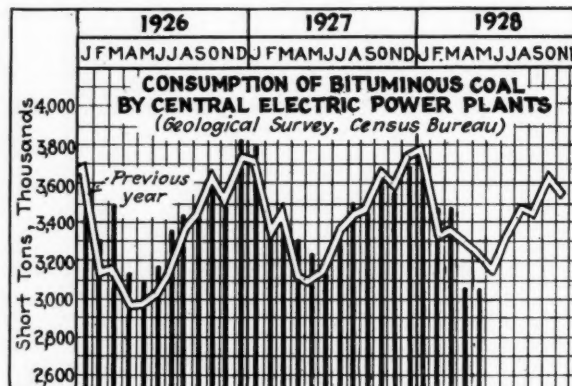
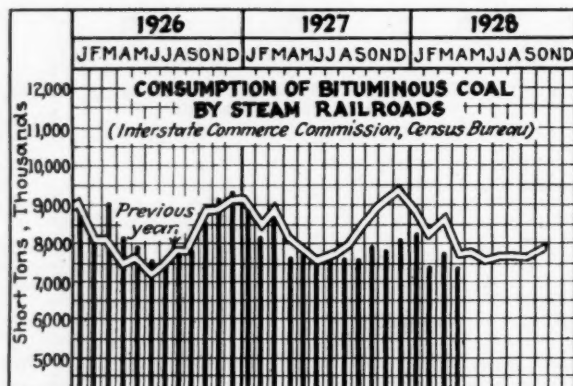
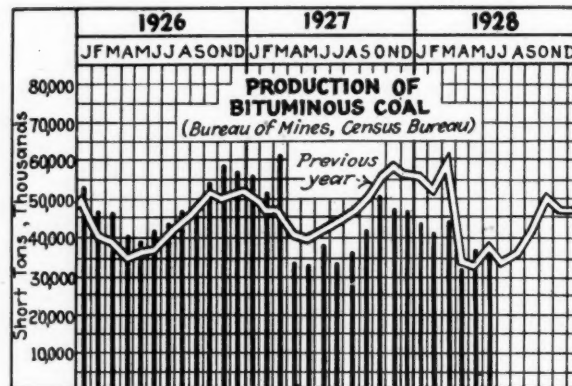
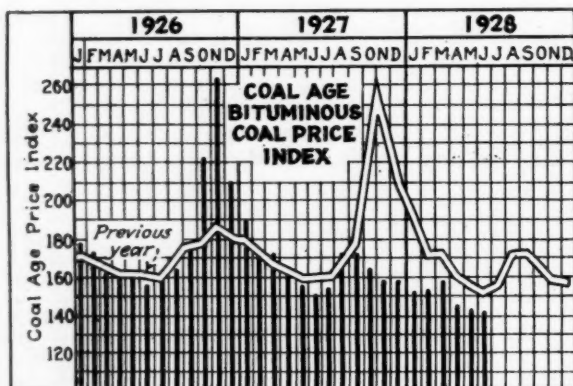
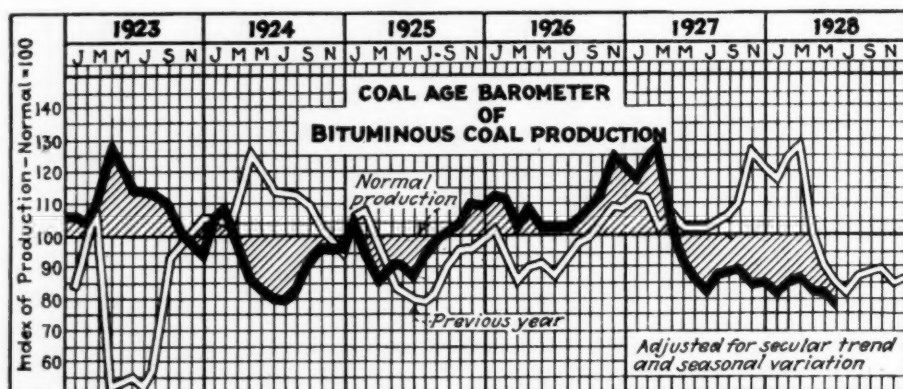
\* \* \*

STEPHENS-ADAMSON MFG. Co. OF CANADA, LTD., following the establishment of a manufacturing plant at Belleville, Ont., has opened branch sales engineering offices at Toronto and Montreal, with A. F. White and George H. Smith, respectively, in charge.

\* \* \*

THE DETROIT BRANCH OF THE BLACK & DECKER MFG. Co., Towson, Md., has moved to new quarters at 11501 Woodward Avenue. J. H. Walker is manager, succeeding H. B. Hazerodt, who resigned. J. C. Goodnight has joined the selling force at this branch, taking the place of Henry Fox, who has gone into business for himself. Leon A. Hardy replaces Jack Caffrey in the New York sales force. H. L. Balke is with the Kansas City branch, covering the territory formerly covered by S. D. Shawgo. G. F. Parr is with the Buffalo office, and has taken over the territory of J. H. Hutton. G. N. McCarthy has filled the vacancy at the Buffalo office made by the transference of H. B. Austin to Chicago. J. A. Murray is working in Baltimore, taking over the accounts formerly sold by Curtiss Watts.

# Indicators of Activities in the Coal Industry





# MARKETS

## *in Review*

**S**TEADINESS was the distinguishing feature of an otherwise dull bituminous market in June. Daily average output, estimated by the U. S. Bureau of Mines at 1,380,000 net tons, was only 7,000 tons under the daily average for the preceding month. Spot prices fluctuated within a narrow range. *Coal Age* preliminary Index of spot bituminous prices for the month was 142 as against the revised May Index of 143½.

At the beginning of June quotations showed a slight increase, but the gain disappeared in a month-end scramble to move tonnage in which Illinois, Indiana, Hocking and central Pennsylvania quotations weakened. Kentucky and high volatile West Virginia prices were uneven, with the most pronounced unsteadiness in West Virginia figures. Low-volatile prices, on the other hand, improved as the month advanced.

*Coal Age* Index of spot bituminous prices was 142 on June 2, 143 on June 9, 142 on June 16 and 23, and 141 on June 30. The corresponding weighted average prices were \$1.72, \$1.73, \$1.72 and \$1.71, respectively. These figures are preliminary. Revised Index figures for May were 143 on May 5, 149 on May 12 and 141 on May 19 and 26. The corresponding weighted average prices were \$1.73, \$1.80 and \$1.71.

**G**ENERAL industrial demand was weak throughout the month, although business as a whole, as reflected in financial reports and car loadings, registered some improvement. The failure of bituminous coal to respond may be set down to two major influences: the fact that some of the

heaviest consumers of coal—notably the steel industry—have been working on a descending scale, and the continued resort to coal in storage.

Lake-cargo shipments constitute the big safety valve for bituminous production at the present time. June dumpings of cargo and vessel fuel were well over 5,000,000 net tons—no small percentage of the monthly output of 35,880,000 tons. Total dumpings to July 1 were 10,109,438 tons. Due to the late start of the season, however, totals to date are still about 5,000,000 tons behind last year and the ability to make up this tonnage is causing concern in some quarters.

Anthracite production and demand took a decided drop last month. Output fell from 8,124,000 net tons in May to 5,300,000 tons. Many retail dealers bought heavily in May to escape the June advance and now find no place to sell the tonnage. The credit situation is proving a bugaboo in the placement of both hard and soft coal with the household consumer.

**P**REPARED sizes of smokeless coal led in activity in the Chicago market last month. Spot lump and egg commanded a premium of 25c. over contract figures with demand so insistent that there was talk of a \$3.50 price after July 10. Mine-run also fared better and a few shippers had nothing to offer. High-volatile interests were more optimistic, feeling that a wave of buying must soon break.

Urban retail distributors, however, showed no desire to increase yard stocks. Fill-up deliveries in the Chicago district were below those of last year. The

credit situation is the chief drawback to more active movement. With many apartment house owners in the precarious financial position, the retailers fight shy of putting in tonnage in buildings where early liquidation of the coal bill is doubtful.

Dullness characterized the market for both domestic and steam grades from the Midwestern field. All districts in Illinois, Indiana and western Kentucky reported unsold cars of coarse coal on track at the mines. In some cases the unbilled loads have interfered seriously with the shipment of tonnage due on steam contracts. While standard producers have maintained prices fairly well, some tonnage is moving through jobbing channels at 25 to 35c. under circulars.

**T**HE FACT that certain important industrial buyers have been using up storage coal would have helped to keep the market in balance were it not for the fact that railroads have been insisting upon 1½-in. lump. This demand has upset calculations of a strong market for fine coal. Midwestern mines are not averaging half-time and unrest among the union miners is growing.

The St. Louis market has been dull, although some hope is held out for improvement during the next few weeks. On the domestic side, anthracite is losing ground to the better grades of eastern Kentucky and West Virginia coal. Coke is holding its own, while oil is gaining and the menace of gas is growing. Western Kentucky presses hard for the low-priced business in industry.

June witnessed no improvement in

### Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

	Market Quoted	June 2, 1928		June 9, 1928 Independent	Week Ended June 16, 1928		June 23, 1928 Independent	June 30, 1928	
		Independent	Company		Independent	Company		Independent	Company
Broken.....	New York.....		\$8. 25						\$8. 25
Broken.....	Philadelphia.....	\$8. 25@8. 50	8. 25	\$8. 25@8. 50	\$8. 25@8. 50	\$8. 25@8. 50	\$8. 25@8. 50	\$8. 25@8. 50	8. 25
Egg.....	New York.....	8. 00@8. 25	8. 50	8. 25@8. 50	8. 25@8. 50	8. 25@8. 50	8. 25@8. 50	8. 25@8. 50	8. 50
Egg.....	Philadelphia.....	8. 50@8. 75	8. 50	8. 50@8. 75	8. 50@8. 75	8. 50@8. 75	8. 50@8. 75	8. 50@8. 75	8. 50
Egg.....	Chicago*.....	7. 59	7. 59	7. 59	7. 59	7. 59	7. 59	7. 59	7. 59
Stove.....	New York.....	8. 35@8. 60	8. 85	8. 60@8. 85	8. 60@8. 85	8. 60@8. 85	8. 60@8. 85	8. 60@8. 85	8. 85
Stove.....	Philadelphia.....	8. 85@9. 10	8. 85	8. 85@9. 10	8. 85@9. 10	8. 85@9. 10	8. 85@9. 10	8. 85@9. 10	8. 85
Stove.....	Chicago*.....	7. 90	7. 90	7. 90	7. 90	7. 90	7. 90	7. 90	7. 90
Chestnut.....	New York.....	8. 00@8. 25	8. 50	8. 25@8. 50	8. 25@8. 50	8. 25@8. 50	8. 25@8. 50	8. 25@8. 50	8. 50
Chestnut.....	Philadelphia.....	8. 50@8. 75	8. 50	8. 50@8. 75	8. 50@8. 75	8. 50@8. 75	8. 50@8. 75	8. 50@8. 75	8. 50
Chestnut.....	Chicago*.....	7. 59	7. 59	7. 59	7. 59	7. 59	7. 59	7. 59	7. 59
Pea.....	New York.....	4. 75@5. 00	5. 00	4. 75@5. 00	4. 75@5. 00	4. 75@5. 00	4. 75@5. 00	4. 75@5. 00	5. 00
Pea.....	Philadelphia.....	5. 00@5. 25	5. 00	5. 00@5. 25	5. 00@5. 25	5. 00@5. 25	5. 00@5. 25	5. 00@5. 25	5. 00
Pea.....	Chicago*.....	4. 45	4. 45	4. 45	4. 45	4. 45	4. 45	4. 45	4. 45
Buck No. 1.....	New York.....	2. 75@3. 00	3. 00†	2. 50@3. 00	2. 50@3. 00	2. 50@2. 85	2. 50@2. 65	2. 50@2. 65	3. 00†
Buck No. 1.....	Philadelphia.....	3. 00@3. 25	3. 00†	3. 00@3. 25	3. 00@3. 25	3. 00@3. 25	3. 00@3. 25	3. 00@3. 25	3. 00†
Rice.....	New York.....	1. 85@2. 25	2. 25	1. 90@2. 25	1. 85@2. 00	1. 85@2. 10	1. 65@2. 10	1. 65@2. 10	2. 25
Rice.....	Philadelphia.....	2. 25@2. 50	2. 25	2. 25@2. 50	2. 25@2. 50	2. 25@2. 50	2. 25@2. 50	2. 25@2. 50	2. 25
Barley.....	New York.....	1. 40@1. 75	1. 70@1. 75	1. 50@1. 75	1. 20@1. 60	1. 15@1. 60	1. 15@1. 60	1. 15@1. 60	1. 70@1. 75
Barley.....	Philadelphia.....	1. 75@2. 00	1. 75	1. 75@2. 00	1. 75@2. 00	1. 75@2. 00	1. 75@2. 00	1. 75@2. 00	1. 75
Birdseye.....	New York.....		1. 60						1. 60

\* Net tons, f.o.b. mines. † Domestic buckwheat \$3.25 (P.&R.) and \$3.50 (D.L.&W.)

Kentucky markets, although operators professed to see a stronger demand in July, but without any appreciable increase in prices. Large industrial concerns, public utilities and the railroads have been drawing upon stockpiles for a large part of their requirements and credit conditions deter retailers from pushing storage deliveries to domestic consumers. River yards in Louisville, however, have taken advantage of transportation conditions to stock up.

**W**ESTERN Kentucky production is far behind the figures for the corresponding period last year and many mines are not averaging better than two days a week. Much interest is manifested in the drive for lower wages in Illinois and Indiana. Kentucky factors claim that wage-cutting will not benefit the Northern fields because any reduction effected will be met south of the Ohio River.

Jobbers are said to be gambling on lower prices in soliciting new business. One contract on screenings at 69c. is reported and several orders have been closed at 90c. @ \$1.15. Mine-run contracts have been offered at price current time of shipment subject to a maximum of \$1.25, with steam nut at \$1.10 @ \$1.25 and lump not to exceed \$1.75 @ \$2.

Eastern Kentucky is enjoying slightly better running time due to an increase in the movement to the lakes. The Hazard field has been running two and three days; Harlan, three days and better. Railroad buying in both sections

of the state is subnormal with one large carrier taking only 60 per cent of its usual minimum. There has been some increase in domestic demand but not enough to cause any surplus accumulation of slack coal.

**A**LTHOUGH outbound business from the docks at the Head of the Lakes has been slowing up, the movement is considered close to normal for this season of the year. On the whole the situation in the Northwest seems to be in good shape. Crop conditions are good and industrial demand from the iron ranges has been looking up. Railroads again have taken the lead in moving up supplies from the mines.

During the past month from 40 to 43 cargoes have discharged every week at the Head of the Lakes. Dock managements estimate that the market will absorb 10,000,000 tons of bituminous coal without any trouble and approximately 900,000 tons of anthracite inclusive of the 275,000 tons carried over from last season. Dock prices on domestic grades of hard coal were advanced 20c. on June 1.

A firmer tone developed in Southwestern markets after the middle of last month although this betterment was not reflected in any general increase in wholesale quotations on domestic sizes. Kansas screenings were easy at the beginning of June but strengthened when heavy rains interfered with the steady operation of the strip pits. The Spadra anthracite field got a late start, but orders have been coming in at a satis-

factory rate since the first mine reopened on June 21.

**P**RICES on storage coal were advanced 25 to 35c. per ton the first of last month, with Bernice (Ark.) anthracite grate quoted at \$6.45; egg, \$6.70; No. 4, \$8.45; chestnut, \$5.45. Arkansas semi-anthracite lump was \$3.50 @ \$4.50; Paris (Ark.) lump, \$5.25; McAlester (Okla.) lump, \$5.70, and Henryetta (Okla.) lump, \$4.

There was no real improvement in the domestic market for Colorado coals last month. On the contrary, demand was so sluggish that the end of June saw approximately 500 "no bills" on mine sidings in the state. However, the call for steam coals was so brisk that the mines averaged about 60 per cent running time. Quotations on Colorado domestic bituminous grades held at May figures; Crested Butte anthracite was \$5 to \$9, according to size. Rock Springs and Kemmerer nut and lump were up 25c. Colorado steam coals were \$1.20 @ \$1.35; Wyoming, \$1.25 @ \$1.35.

From the standpoint of volume June was not a complete disappointment to the Cincinnati trade. The weekly movement through the Cincinnati gateway was well over 11,000 cars and one week the total passed the 12,350-car mark. Lake movement ran from 3,500 to over 3,800 cars per week, but the total lake movement to June 30 was 81,472 cars behind the figures for 1927, or a decline of nearly 33½ per cent.

**T**HE complaints heard arise from the prices received for the tonnage and the restricted channels through which the business moved. Middlemen in particular complained that they were forced out of the picture. On the price side the greatest strength was in the smokeless division. Shippers with a comfortable backlog of orders asked 10 to 25c. above circular for spot tonnage; others not so favorably situated were willing to take less, with stove and nut erratic and slack still heavy.

There was nothing to support the high-volatile market but desire and that was not strong enough to overcome the pressure of unwanted tonnage. As a result quotations were easier all along the line. Venturesome shippers of lump and egg were forced to accept sacrifice prices. Mine-run was none too firm and slack sagged 25c. The better-known coals, however, suffered less.

Dullness continues to be the lot of the Ohio field, with little in demand to spur the efforts of operators to run their mines on an open-shop basis. A few retailers are coming into the Columbus

### Current Quotations—Spot Prices, Bituminous Coal, Net Tons, F.O.B. Mines

LOW-VOLATILE, EASTERN		Market Quoted	June 2, 1928	June 9, 1928	Week Ended June 16, 1928	June 23, 1928	June 30, 1928
Smokeless lump.....	Columbus	\$2.75 @ \$3.00	\$2.75 @ \$3.00	\$2.75 @ \$3.00	\$2.75 @ \$3.00	\$3.00 @ \$3.25	\$3.00 @ \$3.25
Smokeless mine-run.....	Columbus	1.75 @ 2.00	1.75 @ 2.00	1.75 @ 2.00	1.75 @ 2.00	1.75 @ 2.00	1.75 @ 2.00
Smokeless screenings.....	Columbus	.75 @ 1.00	.75 @ 1.00	.75 @ 1.00	.85 @ 1.10	.80 @ 1.00	.75 @ 1.00
Smokeless lump.....	Chicago	2.75 @ 3.00	2.75 @ 3.00	2.75 @ 3.00	2.75 @ 3.25	3.00 @ 3.25	3.00 @ 3.25
Smokeless mine-run.....	Chicago	1.65 @ 2.00	1.65 @ 2.00	1.65 @ 2.00	1.65 @ 2.00	1.65 @ 2.00	1.75 @ 2.00
Smokeless lump.....	Cincinnati	3.00 @ 3.25	3.00 @ 3.25	2.85 @ 3.25	2.85 @ 3.25	2.85 @ 3.25	3.00 @ 3.25
Smokeless mine-run.....	Cincinnati	1.75 @ 2.00	1.85 @ 2.25	1.85 @ 2.25	1.85 @ 2.25	1.85 @ 2.25	2.00 @ 2.25
Smokeless screenings.....	Cincinnati	1.10 @ 1.25	1.10 @ 1.25	1.00 @ 1.25	1.10 @ 1.25	1.10 @ 1.25	1.10 @ 1.25
Smokeless mine-run.....	Boston	3.90 @ 4.15	3.95 @ 4.20	3.95 @ 4.20	4.00 @ 4.25	4.00 @ 4.25	4.00 @ 4.25
Clearfield mine-run.....	Boston	1.50 @ 1.80	1.50 @ 1.80	1.50 @ 1.80	1.50 @ 1.80	1.50 @ 1.80	1.50 @ 1.75
Cambria mine-run.....	Boston	1.85 @ 2.15	1.85 @ 2.15	1.85 @ 2.15	1.85 @ 2.15	1.85 @ 2.15	1.85 @ 2.15
Somerset mine-run.....	Boston	1.65 @ 2.00	1.65 @ 2.00	1.60 @ 2.00	1.60 @ 2.00	1.60 @ 1.95	1.60 @ 1.90
Pool 1 (Navy Standard).....	New York	2.40 @ 2.60	2.35 @ 2.55	2.35 @ 2.55	2.35 @ 2.55	2.35 @ 2.50	2.35 @ 2.50
Pool 1 (Navy Standard).....	Philadelphia	2.30 @ 2.60	2.30 @ 2.60	2.30 @ 2.60	2.30 @ 2.60	2.30 @ 2.60	2.30 @ 2.60
Pool 1 (Navy Standard).....	Baltimore	2.15 @ 2.25	2.15 @ 2.25	2.15 @ 2.25	2.15 @ 2.25	2.00 @ 2.10	2.00 @ 2.10
Pool 9 (super low vol.).....	New York	1.75 @ 2.00	1.75 @ 2.00	1.75 @ 2.00	1.75 @ 2.00	1.75 @ 1.90	1.75 @ 1.90
Pool 9 (super low vol.).....	Philadelphia	1.80 @ 2.15	1.80 @ 2.15	1.80 @ 2.15	1.80 @ 2.15	1.80 @ 2.15	1.80 @ 2.15
Pool 9 (super low vol.).....	Baltimore	1.80 @ 1.95	1.80 @ 1.95	1.80 @ 1.95	1.70 @ 1.80	1.70 @ 1.80	1.70 @ 1.80
Pool 10 (h. gr. low vol.).....	New York	1.60 @ 1.90	1.60 @ 1.90	1.60 @ 1.90	1.60 @ 1.90	1.60 @ 1.80	1.60 @ 1.85
Pool 10 (h. gr. low vol.).....	Philadelphia	1.60 @ 1.80	1.60 @ 1.80	1.60 @ 1.80	1.60 @ 1.80	1.60 @ 1.80	1.60 @ 1.80
Pool 10 (h. gr. low vol.).....	Baltimore	1.50 @ 1.60	1.50 @ 1.60	1.50 @ 1.60	1.50 @ 1.60	1.50 @ 1.60	1.50 @ 1.60
Pool 11 (low vol.).....	New York	1.45 @ 1.65	1.45 @ 1.65	1.45 @ 1.65	1.45 @ 1.65	1.45 @ 1.65	1.45 @ 1.65
Pool 11 (low vol.).....	Philadelphia	1.40 @ 1.65	1.40 @ 1.65	1.40 @ 1.65	1.40 @ 1.65	1.40 @ 1.65	1.40 @ 1.65
Pool 11 (low vol.).....	Baltimore	1.40 @ 1.50	1.40 @ 1.50	1.40 @ 1.50	1.35 @ 1.40	1.35 @ 1.40	1.35 @ 1.40
HIGH-VOLATILE, EASTERN							
Pool 54-64 (gas and st.).....	New York	\$1.25 @ \$1.40	\$1.25 @ \$1.40	\$1.25 @ \$1.40	\$1.25 @ \$1.40	\$1.25 @ \$1.40	\$1.25 @ \$1.40
Pool 54-64 (gas and st.).....	Philadelphia	1.25 @ 1.40	1.25 @ 1.40	1.25 @ 1.40	1.25 @ 1.40	1.25 @ 1.40	1.25 @ 1.40
Pool 54-64 (gas and st.).....	Baltimore	1.35 @ 1.40	1.35 @ 1.40	1.35 @ 1.40	1.15 @ 1.25	1.15 @ 1.25	1.15 @ 1.25
Pittsburgh s&d gas.....	Pittsburgh	2.00 @ 2.10	1.95 @ 2.10	1.90 @ 2.10	1.90 @ 2.10	1.90 @ 2.10	1.90 @ 2.10
Pittsburgh gas mine-run.....	Pittsburgh	1.75 @ 1.90	1.75 @ 1.90	1.75 @ 1.90	1.75 @ 1.90	1.75 @ 1.90	1.75 @ 1.90
Pittsburgh st. mine-run.....	Pittsburgh	1.40 @ 1.80	1.40 @ 1.80	1.40 @ 1.80	1.40 @ 1.80	1.40 @ 1.80	1.40 @ 1.80
Pittsburgh gas slack.....	Pittsburgh	1.10 @ 1.15	1.10 @ 1.15	1.05 @ 1.10	1.05 @ 1.10	1.10 @ 1.20	1.10 @ 1.20
Kanawha lump.....	Columbus	1.75 @ 2.15	1.75 @ 2.15	1.75 @ 2.10	1.75 @ 2.10	1.75 @ 2.10	1.75 @ 2.10
Kanawha mine-run.....	Columbus	1.25 @ 1.60	1.25 @ 1.60	1.25 @ 1.60	1.25 @ 1.60	1.25 @ 1.60	1.25 @ 1.60
Kanawha screenings.....	Columbus	1.00 @ 1.20	.90 @ 1.15	.90 @ 1.10	.85 @ 1.00	.80 @ 1.00	.80 @ 1.00
W. Va. lump.....	Cincinnati	1.50 @ 2.50	1.50 @ 2.50	1.50 @ 2.35	1.50 @ 2.35	1.50 @ 2.50	1.50 @ 2.50
W. Va. gas mine-run.....	Cincinnati	1.50 @ 1.75	1.50 @ 1.65	1.50 @ 1.65	1.40 @ 1.65	1.50 @ 1.65	1.50 @ 1.65
W. Va. steam mine-run.....	Cincinnati	1.30 @ 1.50	1.30 @ 1.50	1.15 @ 1.50	1.10 @ 1.25	1.10 @ 1.40	1.10 @ 1.40
W. Va. screenings.....	Cincinnati	.90 @ 1.15	.85 @ 1.10	.80 @ 1.00	.75 @ 1.00	.75 @ 1.00	.75 @ 1.00
Hocking lump.....	Columbus	2.00 @ 2.25	2.00 @ 2.25	2.00 @ 2.25	2.00 @ 2.25	2.00 @ 2.25	2.00 @ 2.25
Hocking mine-run.....	Columbus	1.60 @ 1.75	1.60 @ 1.75	1.60 @ 1.75	1.60 @ 1.75	1.55 @ 1.75	1.55 @ 1.75
Hocking screenings.....	Columbus	1.15 @ 1.35	1.15 @ 1.35	1.15 @ 1.35	1.15 @ 1.35	1.15 @ 1.35	1.15 @ 1.35
Pitta. No. 8 lump.....	Cleveland	1.75 @ 2.15	1.75 @ 2.15	1.75 @ 2.15	1.75 @ 2.15	1.75 @ 2.15	1.75 @ 2.15
Pitta. No. 8 mine-run.....	Cleveland	1.45 @ 1.80	1.45 @ 1.80	1.45 @ 1.80	1.40 @ 1.75	1.40 @ 1.75	1.40 @ 1.75
Pitta. No. 8 screenings.....	Cleveland	1.10 @ 1.40	1.10 @ 1.40	1.00 @ 1.30	1.20 @ 1.35	1.20 @ 1.35	1.20 @ 1.35

\* Gross tons, f.o.b. vessel, Hampton Roads



market for summer yard supplies, but the total tonnage involved in these orders is relatively small. Here, too, the question of consumer credit worries. Aside from the sales to railroads and utilities the steam trade is slow. Ohio's participation in the lake trade is minor.

**W**ITH the exception of one large interest, the response of the Pittsburgh district to the stimulus of lower rates on lake-cargo coal has been slight. Hopes are high for a wider participation in July lake traffic. General industrial demand continues quiet, but some improvement in slack was noticed toward the end of the month. The heavy demand for lump coal is still a development of the future. The labor situation is easy.

A wide range of prices still rules steam coal in the New England market. Spot demand is scattering in character and small in volume and sales usually are at bargain-counter figures. There is increasing pressure to move nut-and-slack and sales have been made as low as \$3.40 per gross ton f.o.b. vessel at Hampton Roads. Pocahontas and New River mine-run is offered at \$4@4.25, with a few selected coals bringing \$4.35@4.50.

Current prices on cars at Boston and Providence are correspondingly easy. Navy Standard mine-run is held at \$5.20@5.35 per gross ton, but good coal can be had at \$5@5.15 to clean up cargoes. Nut-and-slack is \$4.50@4.60. Pennsylvania offerings are restricted to shipments from low-cost mines, with only a narrow market.

**T**HERE was very little activity in the soft-coal market at New York during June. Spot coal prices remained at the low May levels. Standard grades, however, held their own and a number of producers claimed that they had sufficient orders ahead to keep their mines on a good working schedule. There is a strong feeling in the market that an early change for the better is imminent. This feeling is based upon the steady reduction in industrial stockpiles.

In the Philadelphia bituminous market there has been no improvement in the spot coal situation. The contract situation, too, is unsatisfactory and it is estimated that there is less coal under contract than at any time since the war. Even consumers with contracts are holding down deliveries to the minimum or have cut their regular orders. As at New York, however, there is a feeling that the strong drain upon stockpiles spells better business for the producer before many weeks have passed.

The Birmingham market was unusually dull throughout the month of June. Spot

inquiry was light and this caused shading of prices, particularly on the cheaper domestic and steam grades. Contract shipments were restricted. Bunker trade, however, was fairly active. Coke was quiet. July prices on Cahaba lump are \$3.85@4.60; Black Creek, \$4.10@4.35; Corona, \$3.20; Montevallo, \$4.60@5.35.

**A**NTHRACITE in the New York market is experiencing the usual summer dullness. Demand is quiet and there is little buying since the May spurt flattened out after the first week in June. Company shippers have caught up with their orders; egg now is easy and nut and pea are dragging. Curtailment in production has strengthened the steam list and the buckwheats probably will be the leaders during the next few weeks.

Conditions in the Philadelphia market last month were on all fours with those prevailing in New York territory. Heavy May buying left retail yards with large stocks on hand June 1 and small call from the householder. As a result of the buying slump, mines are now averaging less than three days a week and little improvement is expected before the middle of August. Even steam sizes have been quiet, with buckwheat and barley in surplus, but prices firm.

Demand for anthracite in the Chicago market has not been particularly brisk during the past month. Receipts have fallen below expectations largely because the buying public has been indifferent to efforts of the retailers to sell hard coal for storage. Coke, too, has been moving more slowly than the ovens desired.

May exports of coal—the latest month

for which figures are available—showed a considerable increase over April and marked the high-water total for any month this year. Anthracite exports totaled 266,310 gross tons, as compared with 182,131 tons in April and 304,018 tons in May, 1927. Bituminous exports for the month were 1,144,425 gross tons, as compared with 1,368,467 tons a year ago and 711,101 tons in April, 1928.

**C**ANADA took 989,176 gross tons in May; Italy, 24,798 tons; Brazil, 14,093 tons, and France, 9,448 tons. Another pleasing feature of the Canadian situation was the fact that imports of British anthracite through Montreal to June 15 were only 37,293 tons, as compared with 227,990 tons during the corresponding period last year, and bituminous imports dropped from 23,542 tons to 14,074 tons.

During May the United States imported 30,948 gross tons of anthracite, 28,470 tons of bituminous coal and 10,602 tons of coke. Included in the bituminous imports were 3,034 tons from the United Kingdom. Anthracite imports in May, 1927, were only 40 tons; bituminous imports, all from Canada, 34,905 tons, and coke, 14,125 tons.

Canadian imports of coal from other foreign countries also have fallen off. Last year Canada imported 4,461 tons of German coke and 3,914 tons of Dutch anthracite during the period ended June 15, but for the corresponding period this year there were no receipts from those countries at the port of Montreal. Exports of bituminous coal from the United States to Canada for the first five months of this year were 1,841,061 gross tons under the figures for the same period in 1927.

## Current Quotations—Spot Prices, Bituminous Coal, Net Tons, F.O.B. Mines

MIDWEST		Market Quoted	June 2, 1928	June 9, 1928	Week Ended June 16, 1928	June 23, 1928	June 30, 1928
Franklin (Ill.) lump.....	Chicago	\$2.45@2.60	\$2.45@2.60	\$2.45@2.60	\$2.45@2.60	\$2.45@2.60	\$2.45@2.60
Franklin (Ill.) mine-run.....	Chicago	1.90@2.40	1.90@2.40	1.90@2.40	1.90@2.40	1.90@2.40	1.90@2.40
Franklin (Ill.) screenings.....	Chicago	1.50@1.90	1.50@1.90	1.50@1.90	1.50@1.90	1.50@1.90	1.50@1.90
Central (Ill.) lump.....	Chicago	2.25@2.35	2.25@2.35	2.25@2.35	2.25@2.35	2.25@2.35	2.25@2.35
Central (Ill.) mine-run.....	Chicago	1.85@2.25	1.85@2.25	1.85@2.25	1.85@2.25	1.85@2.25	1.85@2.25
Central (Ill.) screenings.....	Chicago	1.45@1.65	1.45@1.65	1.45@1.65	1.45@1.65	1.45@1.65	1.45@1.65
Ind. 4th Vein Lump.....	Chicago	2.35@2.75	2.35@2.75	2.35@2.75	2.35@2.75	2.35@2.75	2.35@2.75
Ind. 4th Vein mine-run.....	Chicago	1.45@2.25	1.45@2.25	1.45@2.25	1.45@2.25	1.45@2.25	1.45@2.25
Ind. 4th Vein screenings.....	Chicago	1.50@1.85	1.50@1.85	1.50@1.85	1.50@1.85	1.50@1.85	1.50@1.85
Ind. 5th Vein lump.....	Chicago	2.15@2.50	2.15@2.50	2.15@2.50	2.15@2.50	2.15@2.50	2.15@2.50
Ind. 5th Vein mine-run.....	Chicago	1.30@2.10	1.30@2.10	1.30@2.10	1.30@2.10	1.30@2.10	1.30@2.10
Ind. 5th Vein screenings.....	Chicago	1.15@1.50	1.15@1.50	1.15@1.50	1.15@1.50	1.15@1.50	1.15@1.50
Mount Olive lump.....	St. Louis	2.35	2.35	2.35	2.35	2.35	2.35
Mount Olive mine-run.....	St. Louis	2.25	2.25	2.25	2.25	2.25	2.25
Mount Olive screenings.....	St. Louis	1.50	1.50	1.50	1.50	1.50	1.50
Standard lump.....	St. Louis	1.90@2.10	1.90@2.10	1.90@2.10	1.90@2.10	1.90@2.10	1.90@2.10
Standard mine-run.....	St. Louis	1.65@1.75	1.65@1.75	1.65@1.75	1.65@1.75	1.65@1.75	1.65@1.75
Standard screenings.....	St. Louis	1.15@1.25	1.15@1.25	1.15@1.25	1.15@1.25	1.15@1.25	1.15@1.25
West Ky. block.....	Louisville	1.25@1.50	1.25@1.50	1.25@1.50	1.25@1.50	1.25@1.50	1.25@1.50
West Ky. mine-run.....	Louisville	.85@1.10	.85@1.10	.85@1.10	.85@1.10	.85@1.10	.85@1.10
West Ky. screenings.....	Louisville	.85@1.10	.85@1.10	.85@1.10	.85@1.10	.85@1.10	.85@1.10
West Ky. block.....	Chicago	1.25@2.25	1.25@2.25	1.25@2.25	1.25@2.25	1.25@2.25	1.25@2.25
West Ky. mine-run.....	Chicago	1.00@1.25	.90@1.25	.90@1.25	.90@1.25	.80@1.15	.80@1.15
West Ky. screenings.....	Chicago	1.00@1.25	.90@1.25	.90@1.25	.95@1.15	.95@1.15	.95@1.15
SOUTH AND SOUTHWEST							
Big Seam lump.....	Birmingham	\$1.50@2.00	\$1.50@2.00	\$1.50@2.00	\$1.50@2.00	\$1.50@2.00	\$1.50@2.00
Big Seam mine-run.....	Birmingham	1.25@1.75	1.25@1.75	1.25@1.75	1.25@1.75	1.25@1.75	1.25@1.75
Big Seam (washed).....	Birmingham	1.50@2.00	1.50@2.00	1.50@2.00	1.50@2.00	1.50@2.00	1.50@2.00
S. E. Ky. block.....	Chicago	1.50@2.25	1.50@2.25	1.50@2.25	1.50@2.25	1.50@2.25	1.50@2.25
S. E. Ky. mine-run.....	Chicago	1.25@1.50	1.25@1.50	1.25@1.50	1.25@1.50	1.25@1.50	1.25@1.50
S. E. Ky. block.....	Louisville	1.75@2.25	1.75@2.25	1.75@2.25	1.75@2.25	1.75@2.25	1.75@2.25
S. E. Ky. mine-run.....	Louisville	1.25@1.50	1.25@1.50	1.25@1.50	1.25@1.50	1.25@1.50	1.25@1.50
S. E. Ky. screenings.....	Louisville	.75@1.25	1.00@1.25	.90@1.25	.90@1.25	.90@1.25	.90@1.25
S. E. Ky. block.....	Cincinnati	1.75@2.35	1.75@2.35	1.75@2.35	1.65@2.35	1.65@2.35	1.75@2.35
S. E. Ky. mine-run.....	Cincinnati	1.30@1.75	1.25@1.75	1.15@1.75	1.10@1.65	1.10@1.65	1.10@1.65
S. E. Ky. screenings.....	Cincinnati	.90@1.25	.85@1.25	.80@1.15	.80@1.10	.75@1.10	.75@1.10
Kansas Shaft lump.....	Kansas City	3.50@4.00	3.50@4.00	3.50@4.00	3.50@4.00	3.50@4.00	3.50@4.00
Kansas Strip lump.....	Kansas City	2.75@3.25	2.75@3.25	2.75@3.25	2.75@3.25	2.75@3.25	2.75@3.25
Kansas mine-run.....	Kansas City	2.25@2.35	2.25@2.35	2.25@2.35	2.25@2.35	2.25@2.35	2.25@2.35
Kansas screenings.....	Kansas City	3.00@3.50	3.00@3.50	3.00@3.50	3.00@3.50	3.00@3.50	3.00@3.50

# WHAT'S NEW

*In Coal-Mining*

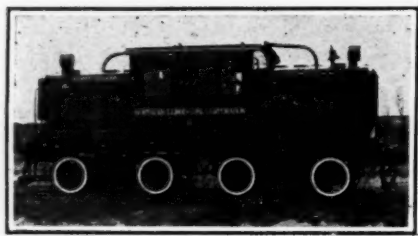


*Equipment*

## Outdoor Locomotives Use Variable Voltage

Smooth acceleration, greater drawbar pull per unit weight, elimination of motor resistance and longer engine life are features of a new gasoline-electric locomotive being made by the Davenport Locomotive & Manufacturing Corporation, Davenport, Iowa. The control method used is essentially the same as that which was developed for large buses propelled by the gasoline-electric system.

The locomotive, of 30-ton size, is a double-end unit—that is, it contains two engine-driven generators which drive the respective truck motors. The engines are Buda, six-cylinder, bored 4½x6, and rated 115 hp. To each engine an 80-kw. 250-volt d.-c. generator is directly connected by means of a shaft tied to the engine with a flexible



Fitted for Long Service

coupling and extending through the hollow shaft of the generator and tied thereto through another flexible coupling located at the outside end.

Electrical connections from each generator to the respective truck motors are made through a drum switch having parallel and series positions for both forward and reverse. Resistance is not necessary in starting the motors because the control is by variable voltage obtained by adjusting the engine speed.

When the locomotive makes a stop the engines idle at a very slow speed. The locomotive is started by setting the unit-controlled drum switches in the desired position, then advancing a lever which is connected to the throttles of both engines. At low engine speed the generator is excited to a low value by a 12-volt battery. As soon as the voltage rises to 60 the auxiliary field is cut out automatically and the generator is self-excited.

With this variable voltage control the gasoline engines should have a

comparatively long life because they are operated at maximum speed only when the locomotive is pulling near capacity.

Standard electrical equipment for these locomotives consists of motors and generators made by the General Electric Co.

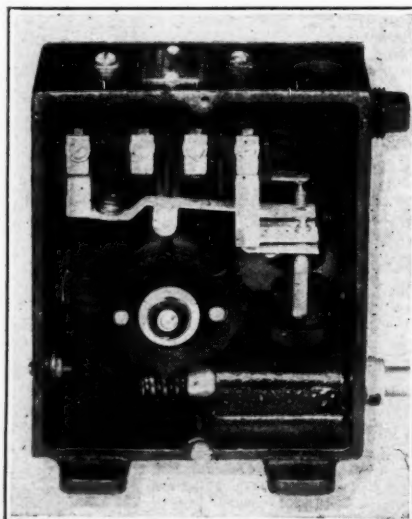
## Simple Limiter Designed For Motor Drives

Applications of electric motors to operate doors, shaft gates, valves, gates in coal chutes and so on call for the use of a switch which will stop the motor when either limit of travel is reached. For such duty, providing magnetic control is used, the General Electric Co. announces the "CR-9441-LS-424-A" limit switch.

The contacts are operated by two cams mounted on opposite faces of a molded gear. These cams are adjustable with respect to each other and each contact has a micrometer screw for fine adjustments. The entire mechanism, including a worm gear drive, is inclosed in a cast-iron box with sheet-steel cover.

Silver contacts are used, thus insuring good contact regardless of oxidation, since silver oxide is a good conductor. No tools are required for ordinary adjustments, and by removing one screw the molded gear can be moved out of mesh with the worm, thus allowing a radical change in setting. Molded insulation of electrical parts allows adjustment while the switch is live.

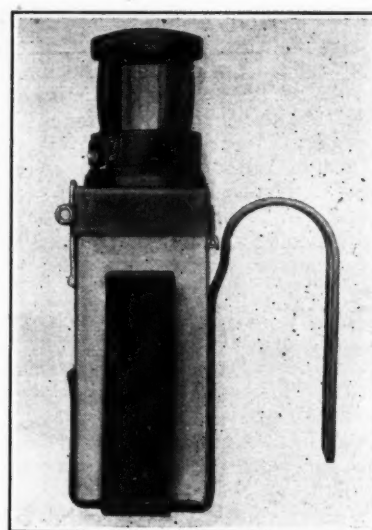
Geared Time Limit Switch



## Safety Trip Lamp Sheds Light at All Angles

A new Edison electric safety trip lamp has been brought out by the Mine Safety Appliances Co., Pittsburgh, Pa. The lamp bears the U. S. Bureau of Mines approval No. 1002. It can be hung on the side or back of a car and provides illumination at all angles.

The lamp consists of a heavy nickel-plated steel battery container holding two standard model E Edison cells.



Simple but Effective

The container is locked magnetically and is held to the pit wagon by means of a heavy forged steel holder. The ruby glass cylinder surrounding the bulb is screwed and locked in place by means of a heavy cast ribbed top. The new lamp can be charged on model E or G Edison racks by special placing of charging clips.

## Portable Air Compressor Of Larger Size

A seventh size has been added to the line of portable air compressors manufactured by the Ingersoll-Rand Co., 11 Broadway, New York City. This new size (4½-in. bore by 4-in. stroke) has a piston displacement of 82 cu.ft. per minute. It is intended primarily for users requiring a unit of slightly larger capacity than the 4½- x 4-in. 66-cu.ft. machine.

The new compressor, like the other



## What's NEW in Coal-Mining Equipment

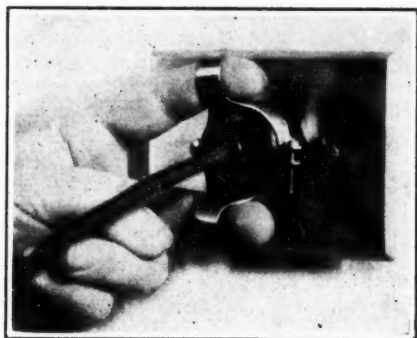
I-R portables, is equipped with a four-cylinder tractor-type Waukesha motor. It is available on broad-faced steel wheels, on steel wheels with rubber tires, on I-R trailer mounting, on Ford or Chevrolet truck, or without running gear for mounting on skids, railway car, etc.

The new unit embodies all the features found on the other six sizes.

### Pull-A-Plug Obviates Frayed Wires

Pull-A-Plug is an electric attachment perfected by the Ren Mfg. Co., Winchester, Mass., designed to do away with frayed wires, burned-out fuses and broken plug caps on electric apparatus.

The device is readily slipped onto standard plug caps of any size, style or make, and is quickly fastened by tightening the screw; it will not slip



Saves Frayed Wires and Nerves

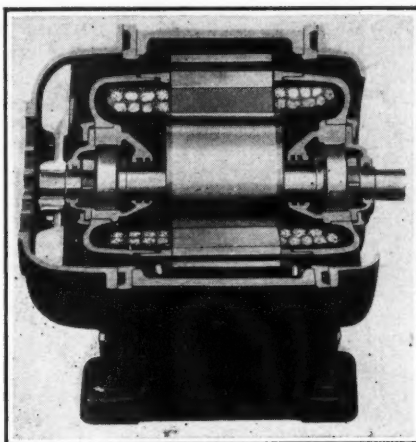
off. No rewiring is necessary. The two curved arms form convenient grips for the fingers.

It also serves as a shield and protects the plug cap from breakage. It is finished in black Japan to match the hard-rubber or composition plug. The Pull-A-Plug is patented in the United States and Canada.

### Totally Inclosed Motor Armed Against Grit

A new type of completely inclosed ventilated motor with a 40-deg. rating has been perfected by the American Electric Motor Co., of Cedarburg, Wis. The inclosed hoods, which hermetically seal the winding, are telescoped into a ring fastened to the stator laminations, the surfaces of which are machined.

Cooling of this type P-K motor is unusual in that air is driven through as well as over the stator laminations. The stator core is perforated, thereby making it possible to remove the heat at the point where it originates. Air in the inclosed portion is agitated by



Clean as a Hound's Tooth

malleable cast fans shrunk on the motor shaft.

The ball bearings are of the cage type. The inclosing hood of the motor can be removed without disturbing the bearing, which remains on its shaft inclosed in its cage. No dust or grit can get into the bearing, nor can any grease escape as felt washers are imbedded in the cap to keep it in.

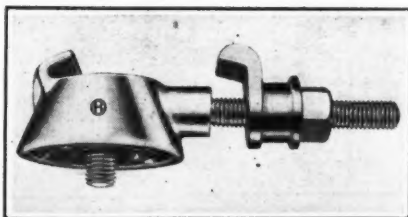
The stator is removable. Should it be damaged it can be replaced in a few minutes by any mechanic. The top of the slot is sealed by a U-shaped wedge, thus eliminating any possible creeping surfaces from the winding to the core. The ends of the windings are taped well within the slot, eliminating any possibility of breakdown between the wire and the end of the slot insulation.

The rotor is of the usual construction with the exception of its winding. The end rings are electrically welded to the bars, forming an indestructible one-piece squirrel cage of uniform material.

### Trolley Wire Hanger for Steel Roof Beams

For suspending trolley lines from I-beam roof supports, the Ohio Brass Co., Mansfield, Ohio, has developed a combination hanger and clamp. This device is thoroughly insulated. The hanger is made to fit I-beam or rails with 3 to 5 in. bottom width dimension and also is furnished on order in special sizes to fit roof supports smaller than 3 in. and larger than 5 in.

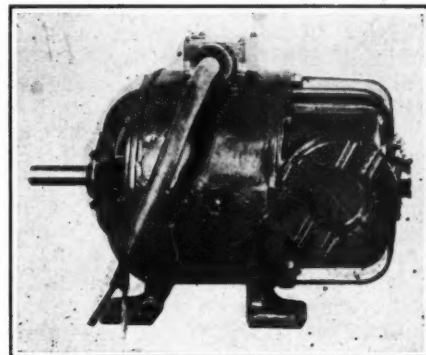
Two-in-One Trolley Wire Hanger



### Small Permissible Motors For Gassy Mines

Direct-current motors with starting switches, designed to meet the requirements of the U. S. Bureau of Mines for equipment permissible for use in gaseous mines, have been developed by the General Electric Co. and are offered in 1-, 3- and 5-hp. ratings. These equipments are for use on mine pumps, room conveyors and for similar applications where constant-speed, direct-current motors are suitable.

These motors and starters, when included in an assembly of elements submitted for approval to the Bureau of Mines, will not themselves need to be tested in an explosive mixture, since they have already met the requirements of such test; but the approval plate can be applied only when the whole



For Use in Gassy Mines

assembly has been approved, which is in accordance with the Bureau's established practice.

Motors and starters are totally enclosed, the object being to prevent any heat generated inside the apparatus from any cause whatever from being transmitted to the outside in such intensity as to ignite any gases surrounding the equipment. The three ratings are all 1,150-r.p.m., 230-volt, compound-wound, constant-speed machines. The motors are suitable for geared, belted or direct-connected service, and also can be supplied for 500-volt service, with shunt or compound winding. They will carry their rated load continuously without exceeding 75 deg. C. rise when operating in an ambient temperature of 40 deg. C.

### Stator Slot Cleaning Made Easy

In the August, 1927, issue of this magazine, page 116, was described a slot-cleaning machine for cleaning out old insulation from armatures of d.c. motors, marketed by the Martindale Electric Co., Cleveland, Ohio. This company has just added to its slot-cleaning outfit a right-angle handpiece which extends the use of the grinding

## What's NEW in Coal-Mining Equipment



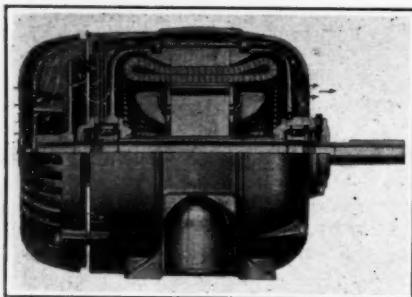
Fits the Job

disks to the stator of a.c. motors. Although not quite so convenient, this attachment serves the same purposes as the straight handpiece for cleaning out the slots of d.c. motor armatures.

### Motor for Dusty Places Has Air Cleaner

Announcement has been made recently by the Fairbanks, Morse & Co., Chicago, Ill., of a line of self-ventilated enclosed motors which have an air cleaning arrangement for insuring reliable operation in dusty atmosphere. It is said that the new motor is impervious to all dirt in the air; built in accordance with standard design; cleans its own air and requires no piping of any kind; reduces fire hazards and does not require any special attention.

It has standard stator core, windings and rotor, mounted in a supporting shell with an annular air passage between the outside surface of the stator core and the shell. Winding shields are provided



Section of Air Cleaner, Inclosed Motor

so that the stator windings are totally enclosed. Cooling air is drawn through an inlet opening at the free end of the motor by means of a special type fan which also functions as an air cleaner. The clean air is blown across the winding shield at the free end of the motor, through the annular air space, then across the outer end of the stator core laminations, and finally across the winding shield at the pulley end and out through openings in the pulley end bearing arm.

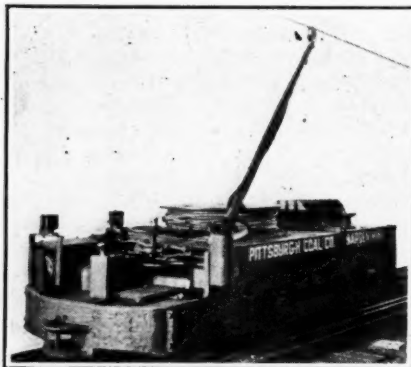
The fan is of the closed impeller type and is so constructed that the foreign particles are thrown out by centrifugal force, between the edge of the outer shroud and the supporting frame. A perforated guard is placed around this

fan-cleaner and is carried by the supporting frame. The whole purpose of this guard is to prevent accidental contact with the fan; the fan itself being an entirely self-contained air cleaner and blower.

Provision is made for lubricating the ball bearings of this motor without removing the guard, fan or bearing arms. This is accomplished by the use of a plunger device located in a grease tube extending through an opening in the bearing into the bearing housing.

### Sealed Cable-Reel Locomotive

A slated cable-reel unit with all parts except the trolley pole and reel cable totally inclosed has been added to the line of mine locomotives of the General Electric Co. Aside from the flexible



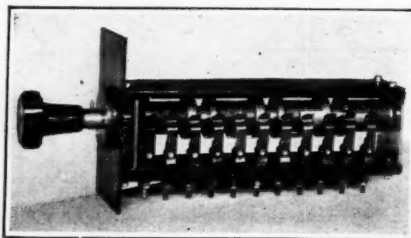
A Compact Unit

motor cables, which are carried in heavy rubber hose with sealed fittings, all wiring is inclosed in slated fittings. The locomotive is provided with progressive series-paralled control. It has a draw-bar pull of 4,000 lb. at 5 m.p.h.

### Instrument Switch Fits In Small Space

A new type of switch, used for connecting any instrument or group of instruments selectively to various circuits as may be required for metering, synchronizing or for other switching functions has been introduced by the Westinghouse Electric & Mfg. Co. It is of the rotary type. It is especially adapted to mounting in small space.

Handy Connector to Various Circuits



### Small A.C. Starter Is Flameproof

The field of standard type ZO across-the-line starting switches has been extended to small a.c. motors by the Electric Controller & Mfg. Co., Cleveland, Ohio. The small switch is inclosed in an ironclad tank and, as in the larger sizes, all the contacts, including the overload trip, open and close under oil. Consequently the starter is flameproof.

### Detects Sounds, Leaks And Obstructions

To enable the engineer to locate more readily and accurately sounds in mines, the position of loose pistons and cross-head and main-bearing knocks in steam engines and power-plant machinery the improved twin model Transmit-O-Phone was introduced by the International Metal & Specialty Co., Berlin, N. J.

The instrument consists essentially of the headpiece *A*, twin amplifiers *B*, with connecting hose *C*, vibration disks *D*, and sound-transmitting rods *E*, with corks to clarify and cushion the sounds. With two amplifiers the knock is more readily located and the operator is enabled to distinguish two different sounds in close proximity to each other or to detect sounds from two different points at the same time.

The ear tabs are offset to fit snugly and evenly in each ear and to keep out external sounds. The disks *B* are used for locating light sounds, and the rods *E* with cork tips for sharp or loud sounds. The Y-piece *F* is used where one amplifier only is necessary to locate the sound.

Among the uses claimed for the instrument, in addition to those already mentioned, are detecting leaky steam valves, loose journals, leaky steam traps, leaks in air and water lines, and locating hidden pipes and conduits.

The Engineer's Stethoscope

